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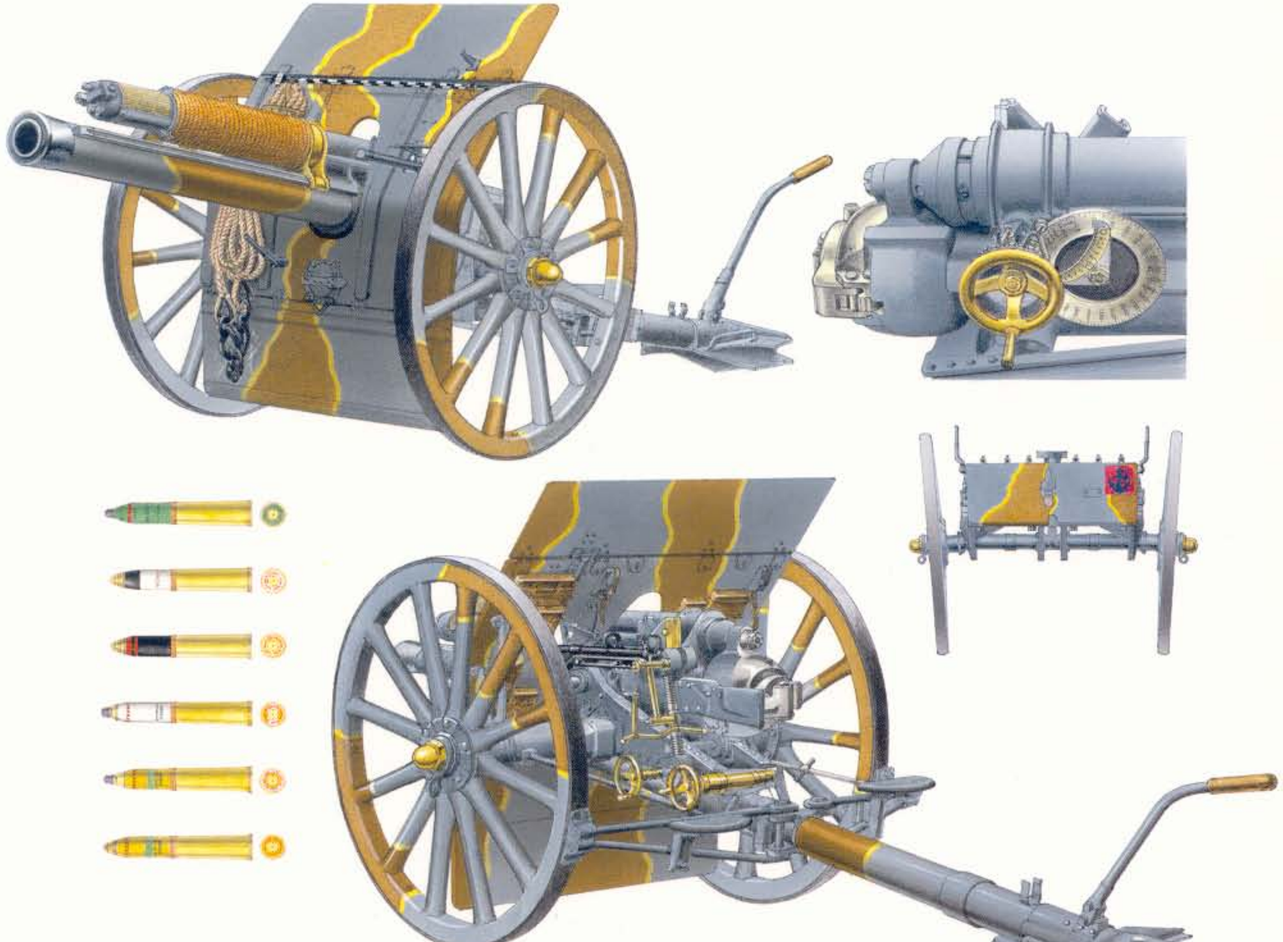
British Artillery 1914–19

Field Army Artillery



Dale Clarke • Illustrated by Brian Delf

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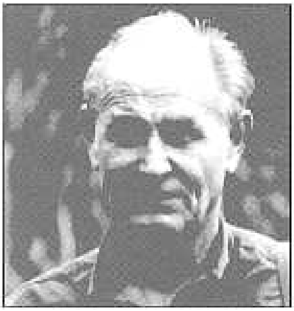

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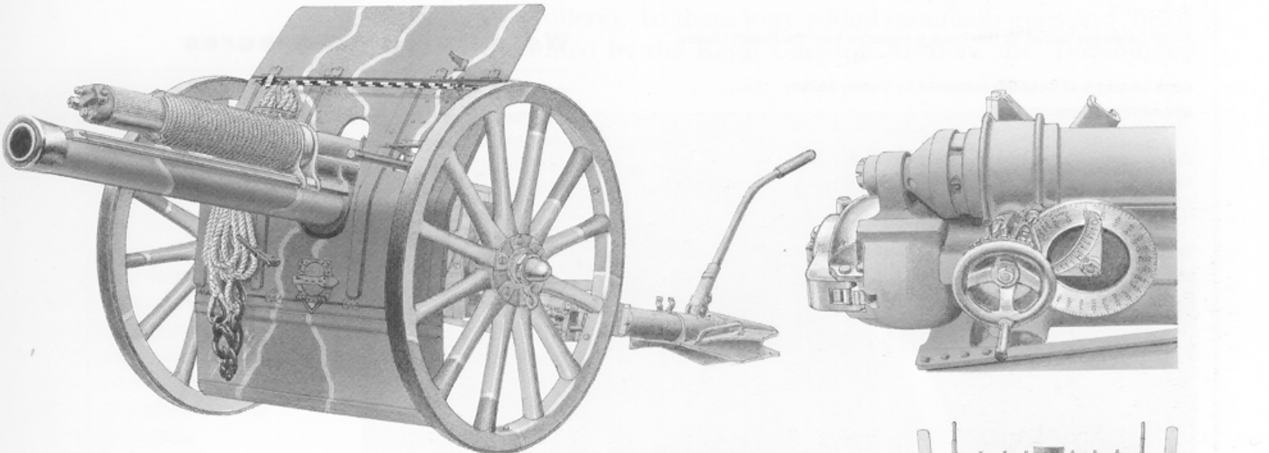

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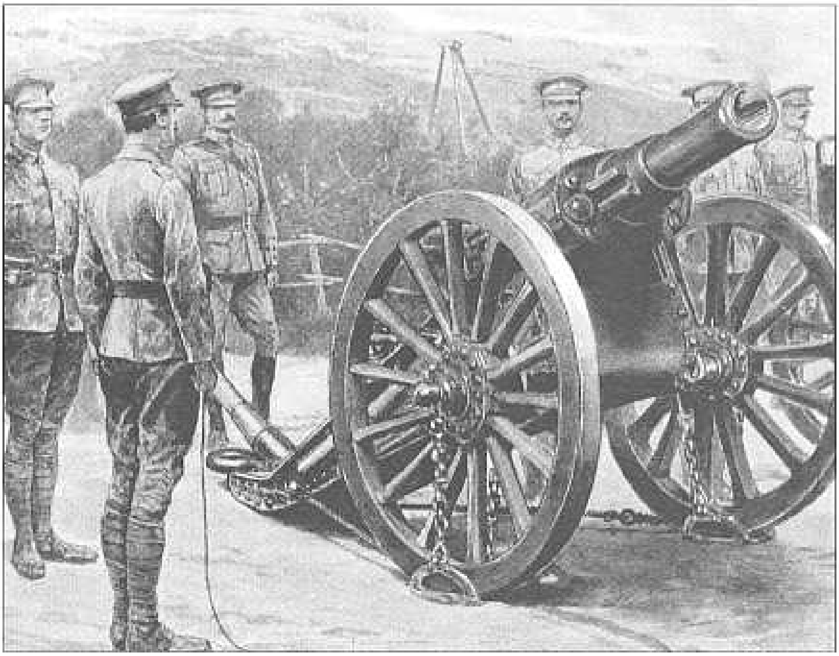
Weights and measures

Measurements in this book are given in the Imperial units in use in Britain at the time. Readers unfamiliar with these may use the following conversion table, which also shows abbreviations used.
1 ounce (oz) = 28.32 grams (g)
16 ounces = 1 pound (lb) = 0.453 kilograms (kg)
14 pounds = 1 stone (st) = 6.5kg
2 stones = 1 quarter (qr) = 12.7kg
4 quarters = 1 hundredweight (cwt) = 50.8kg
20 cwt = 1 ton = 1.016 tonnes = 1.12 US tons
1 inch (in. or ") = 25 millimetres (mm)
12 inches = 1 foot (ft) = 30.5 centimetres (cm)
3 feet = 1 yard = 0.914 metres
1,760 yards = 1 mile = 1.61 kilometres (km)

BRITISH ARTILLERY 1914–19: FIELD ARMY ARTILLERY

INTRODUCTION

In 1914, British Army artillery equipments sufficiently mobile to accompany troops in the field were classified as 'Artillery of the Field Army' (as opposed to siege and fortress 'Artillery of Position'). Field Army artillery comprised of the light field guns of the Royal Horse Artillery and the field guns and howitzers of the Royal Field Artillery (which together consituted the 'Mounted Branch' of the Royal Regiment of Artillery). To these were added mountain guns and 'heavy field' guns manned by the Royal Garrison Artillery, the 'Dismounted Branch', which also manned Britain's siege and coastal batteries. The Mounted Branch rode into action, while the Dismounted Branch marched.



Field howitzer and crew c. 1910. The breech-loading 5-in. howitzer was phased out of Regular Army service in 1908 and issued to field batteries of the Territorial Force with whom it continued to serve into World War I. The firing 'number' (front left) held the lanyard in his right hand, with his arm bent across his body, and fired the howitzer by executing a sharp turn to the right. (Print after R. Caton-Woodville)

Royal Horse Artillery

The Royal Horse Artillery (RHA) provided artillery support for the cavalry and was equipped with light field guns. It was a *corps d'élite* within the Royal Artillery. A junior officer would not be considered for service with the RHA ('earning his jacket') until he had completed at least six years' service with the Royal Field Artillery (RFA), and was an accomplished horseman. Although the RHA was extensively employed in its traditional role during the mobile warfare of 1914–15, the lack of opportunities for cavalry action on the Western Front resulted in RHA batteries becoming increasingly interchangeable, in role and equipment, with those of the RFA. On other fronts, horse artillery batteries (frequently from the Territorial Force – *see below*) continued to operate in their traditional role throughout the war.

Royal Field Artillery

The Royal Field Artillery (RFA) provided the artillery support for the infantry divisions of the British Army. All ranks being mounted on horses or various limbers and wagons, RFA batteries of this period were scarcely less mobile than those of the RHA. In 1914 the RFA was equipped with field guns and field howitzers on a scale of one howitzer brigade for every three brigades of guns.

Royal Garrison Artillery – mountain and heavy batteries

The Royal Garrison Artillery (RGA) provided the army in the field with mountain batteries of light guns (and later howitzers) that could be dismantled and carried into action on the backs of mules. Mountain artillery provided pre-war RGA officers with opportunities for active service abroad and there was tough competition for postings. Three RGA mountain artillery batteries went to the Western Front in 1914, but proved unsuitable and were withdrawn and sent to Egypt. However, extensive use was made of mountain artillery in German East Africa during the Salonika campaign and in the Dardanelles. Mountain artillery was re-named 'Pack Artillery' in 1920.

Heavy batteries were added to the field army following experience in South Africa, during the Boer War (1899–1901), when Boer guns outranged the British field artillery. 4.7-in. naval guns were mounted on field carriages as a temporary expedient and, as these guns were also in service with the RGA in coastal defences, some RGA batteries were subsequently equipped as 'heavy field'. One RGA heavy battery was attached to each infantry division sent to France in 1914.

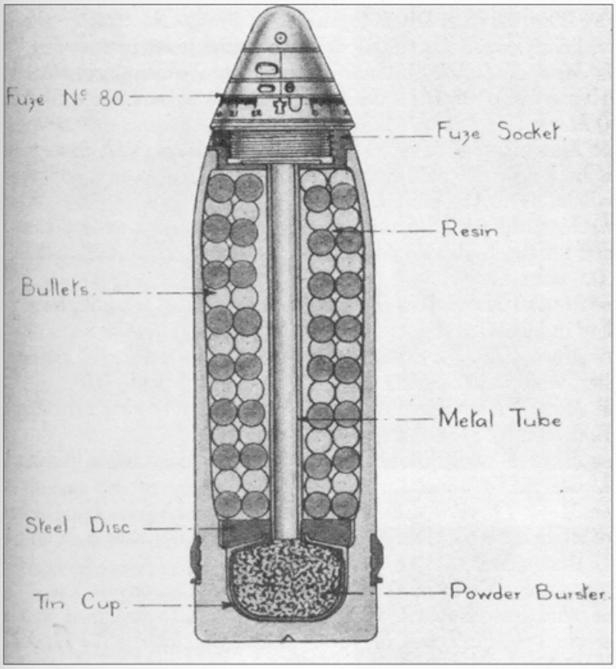
The Reserves and the Territorial Force

Before World War I Great Britain rejected compulsory military service in favour of a system based on a professional army in which men enlisted 'with the colours' for a period, after which they continued to be liable for service, as reservists, for a further period. In the case of the RHA and RFA, these were six years' service and six years in the Reserve – eight years' service and four in the Reserve for the RGA. To the Regulars and Reservists were added the part-time volunteers of the Territorial Force (TF), established in 1908, to replace the old Yeomanry, Volunteers and Militia. The artillery of the Volunteers and Militia had been largely static or siege 'Artillery of Position'. The new Territorial Force, however, was required to be a 'complete army' and, from 1908, formed mountain, horse, field and heavy batteries.

The Empire and Dominions

Throughout the Empire and Dominions, local artillery units existed, Regular and Volunteer. Although these colonial units generally followed

OPPOSITE **BL 15-pdr field gun. This view of a gun at HM Royal Armouries, Fort Nelson, shows the distinctive tubular case for the recoil spring. The spade is just visible (in the stowed position), as is the wire cable which joined it to the spring. The gun is displayed on late 2nd class C No. 45 wheels, with rubber treads. It would originally have had iron-tyred 14-spoke No. 35A wheels, without dustcaps. The breechblock is missing. (Author's photograph, reproduced by kind permission of Bapty and Co. Ltd.)**



ABOVE **The primary weapon of British horse and field artillery from the 1890s to 1915, the shrapnel shell, was designed to kill troops deployed in the open. The 18-pdr shell contained 374 lead and antimony bullets of 40 to the pound, the 13-pdr, 236. (Author's collection)**

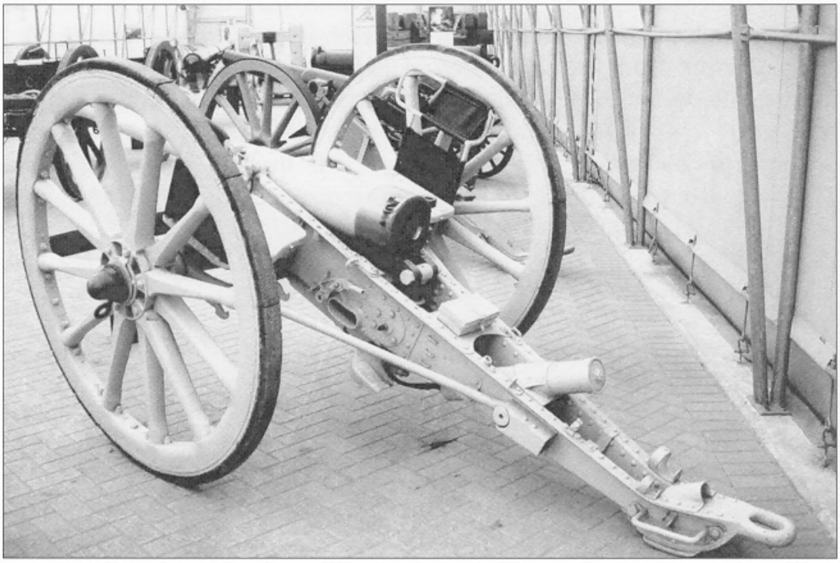
British practice (India exercised considerable independence in the selection and design of equipment), obsolescent equipment frequently remained in service on the furthest frontiers. Elderly field artillery also survived as 'movable armament' to defend the landward approaches of the Empire's coastal batteries and coaling stations.

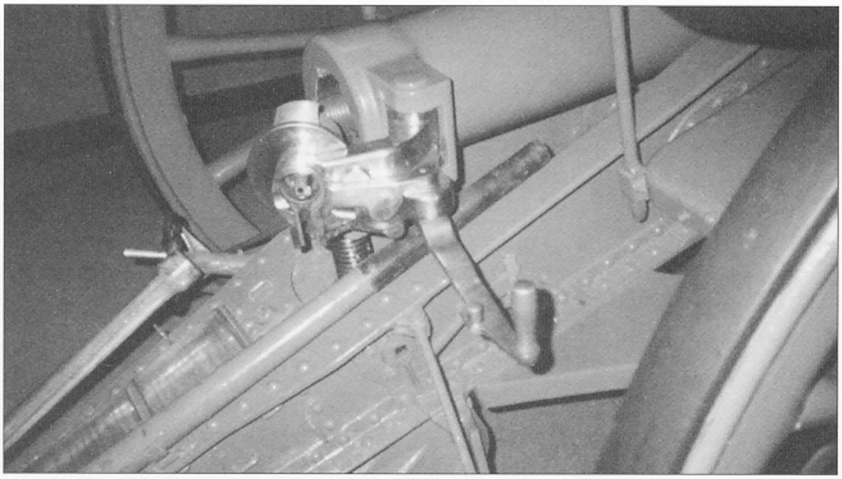
The role

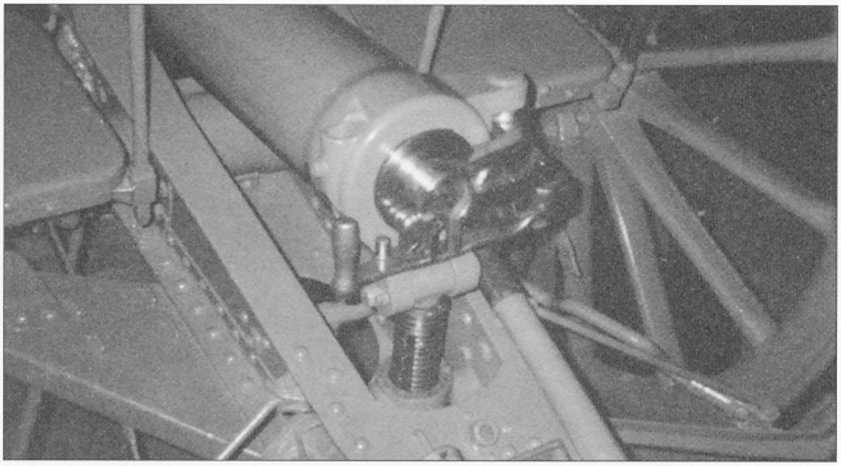
In the attack, field artillery would fire on the enemy until the last possible moment, to keep the defenders' heads down. In defence, their fire would break up the enemy advance. To achieve this, the guns fired shrapnel shell, an anti-personnel projectile containing hundreds of lead alloy balls ('bullets'), tightly packed around a bursting charge. The gunpowder bursting charge was detonated by a time fuse, the balls showering down in a cone-shaped burst. Howitzers used high explosive (HE) ammunition, a shell packed with 'lyddite' explosive and fitted with a percussion fuse to burst on impact. HE shells depended for their effect on blast and fragmentation (shell 'splinters').

MODERNISATION AND EXPANSION

RHA and RFA batteries fought the Boer War (1899–1901) with breech loading (BL) guns dating from the 1880s: a 12-pdr for the RHA and a similar, but heavier, 15-pdr for the RFA. These were robust and simple weapons. The barrel (albeit breech-loading and rifled) was mounted directly on to a wrought-iron carriage of traditional design. On firing,





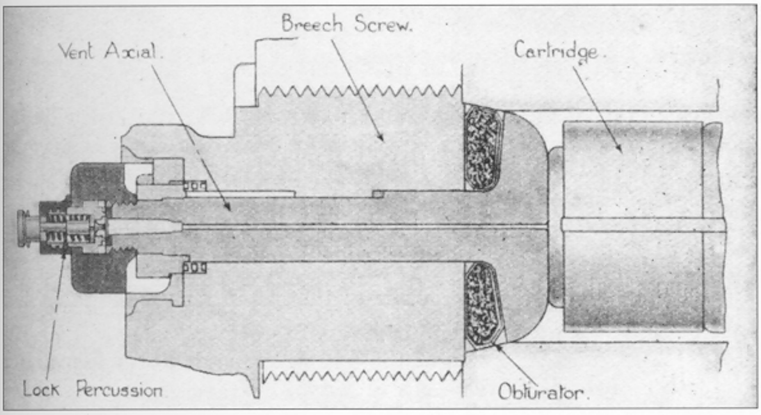


LEFT & BELOW **BL 15-pdr 'Wellin interrupted parallel screw breech opened and closed. Pulling the 'lever breech mechanism' rotated the breech screw and swung open the breech in a 'single motion'. The earlier style required the breech to be unscrewed, pulled to the rear and swung clear in three separate movements. (Author's photographs, reproduced courtesy of RAHT)**

the gun recoiled violently. To fire again, it had to be run up (pushed back into position), laid (aimed at the target) and the 'three-motion' breech unscrewed. A shell was rammed home, then a bag of propellant charge, the breech screwed closed, a friction ignition tube placed in the vent, and the firing lanyard hooked in. The gun was then ready for firing – after which the whole process had to be repeated. From 1899 both guns were "modernised" with a new 'single action' breech and a primitive recoil system (a large sprung spade hung beneath the axle). These modifications did increase the rate of fire, but the result was far from the ideal – the 'Quick Firing' field gun.

'Quick Fire' artillery

During the 1890s commercial manufacturers, such as Vickers, Sons and Maxim Ltd., had developed 'Quick Fire' guns, for naval or coastal use against fast-moving vessels. The gun barrel was allowed to recoil within a jacket or 'cradle', slowed by a hydraulic buffer (resistance created by pushing oil through a narrow aperture) and then returned to firing position by powerful 'running out' springs. As only the barrel moved, there was no need to re-lay the gun between shots. Breeches were of quick-acting single-motion interrupted-thread or sliding-wedge type, using a brass

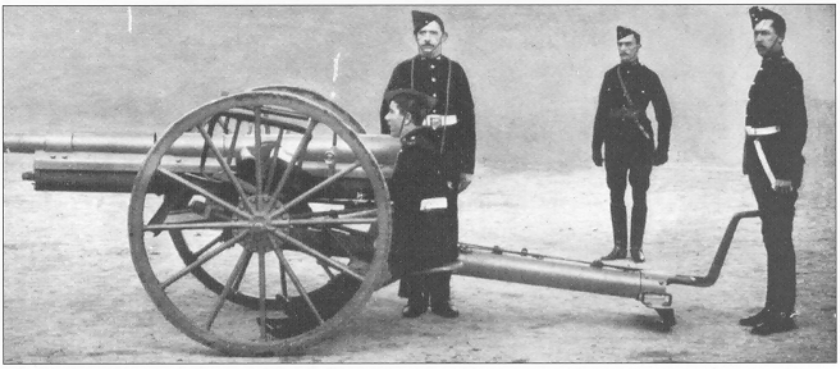


Cutaway of the breech screw of a BL gun. The T-shaped steel 'mushroom piece' was forced back when the gun was fired, squeezing the obturator (an asbestos ring) outwards, to make a gas-tight seal at the breech. (Author's collection)

cartridge case to contain the propellant and primer – speeding and simplifying loading. The soft metal case also provided 'obturation' (gas-tight sealing), replacing the expanding pad used in the breeches of BL guns. Smaller ammunition, in the 75mm/12-pdr category, could even be 'fixed', with the projectile, charge and primer all in a single 'round', similar to small arms ammunition. These 'QF' guns could fire 20 aimed shots in a minute, where a BL gun could fire four – and a race was on to adapt the technology for field artillery of a similar calibre.

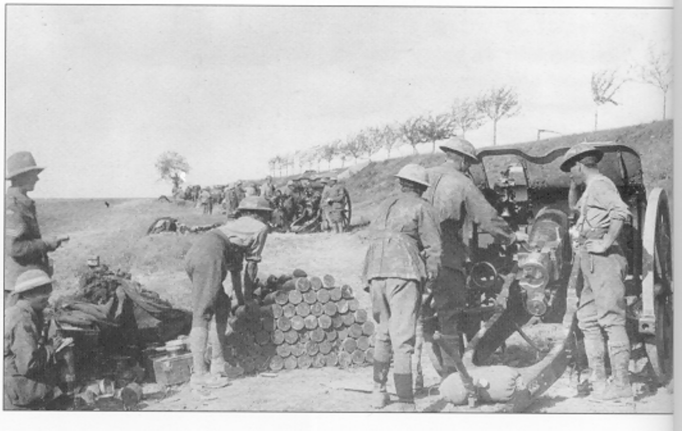
The Boers, and British Volunteer batteries (such as that of the City Imperial Volunteers), deployed early commercial QF field guns, but these were not entirely successful, as their 'recuperators' (buffers and springs) were ineffective and, on their wheeled carriages, the guns still recoiled enough to require re-laying between shots. They were 'rapid-fire' rather than true 'Quick Fire'. From France, however, came rumours of a new 75mm field gun that was a true 'Quick Firer'. Surrounded by tight security, the *Soixante-Quinze* ('Seventy-Five', from its 75mm calibre) made its debut in the French Army manoeuvres of 1900, providing the impetus for a complete overhaul of British field artillery. The approach was pragmatic. After a wide search, a true Quick Firer, the 15-pdr 'Ehrhardt', was bought from a German manufacturer, saving, it was claimed, some five to ten years of development, then specifications for new QF field guns and howitzers were drafted and issued to British arms manufacturers. These resulted in the QF 13-pdr and 18-pdr guns, and 4.5-in. howitzer, which entered service with the Regular Army between 1904 and 1908.

The use, during the Boer War, of Royal Navy QF guns on field mounts demonstrated that heavy artillery could be mobile enough to support the field army, resulting in the adoption of the QF 4.7-in. gun in a heavy field role, and later the BL 60-pdr. The point was emphasised again, in the Russo-Japanese War (1904–5), when the Japanese showed great imagination in their use of artillery – including the use of indirect fire (firing from cover at an enemy visible to an observer, but not to the battery)



The QF 15-pdr 'Ehrhardt' newly delivered in 1901, with axletree seats and distinctive all-metal wheels. Compare this with the modified Carriage Mk. I* illustrated on page 23. (Author's collection)

directed by observers with field telephones. From 1904 the *Entente Cordiale* (warming of relations with France) brought access to French military technology and doctrine, resulting in much discussion about the tactical employment of QF guns and whether, given the higher rate of fire, the British six-gun field battery should be replaced by one of four guns on the French model.



Indirect fire. A battery of 4.5-in. howitzers of the 105th Brigade, Australian Field Artillery, in position behind an embankment, Bray-sur-Somme, 26 August 1918. (IWM E(AUS)3115)

Volunteers and 'New Armies'

In 1908, while the Regular artillery was re-equipping with QF guns and howitzers, it also became necessary to equip new Territorial Force's horse and field batteries. This was achieved by modifying and modernising the elderly and obsolescent guns and howitzers discarded by the Regulars. Organised in four-gun batteries, the resulting equipment was sufficient to teach the Territorial Force their craft. Going to war with these weapons against a modern, technologically advanced European army was another matter entirely. Indeed, dissatisfaction was already growing with the QF field guns of the Regular artillery, chiefly due to their lack of range, and in 1913 work commenced on specifications for a new field gun, a project overtaken by the outbreak of war.

From September 1914 onwards Kitchener's 'New Armies' added to the field artillery. By January 1916 even the 2.6 million New Army volunteers were insufficient to meet the voracious demands of the Western Front, and conscription was introduced. This huge expansion of the Army created chronic shortages; training had to be carried out using obsolete guns, or even wooden guns and 'dummy loaders' (replica gun breeches into which drill ammunition could be loaded). However, production gradually caught up with demand and, during 1916, TF and New Army field artillery batteries on the Western Front were re-equipped with QF field guns and howitzers, the older BL guns and howitzers being returned home for use in training.

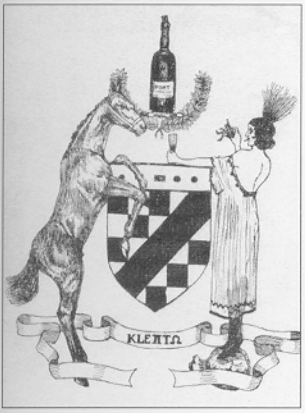
ORGANISATION

The key organisational unit of the horse and field artillery was the *battery*, a major's command of five officers and around 200 men. Batteries enjoyed almost complete autonomy, compared with cavalry squadrons or infantry companies, which were subordinated to (respectively) their regiment or battalion. RHA batteries (equipped with six QF 13-pdr field guns) were designated with letters, in order of seniority. Regular Army RFA batteries were numbered in order of seniority. Those of the British Expeditionary Force (BEF) in France consisted of six QF 18-pdr guns or 4.5-in. howitzers. Territorial Force and New Army batteries were designated A to D Batteries, *N*th Brigade (D/174 for example) and consisted of four BLC (Breech Loading, Converted, *see below*) 15-pdr guns or BL 5-in. howitzers. Four-gun batteries subsequently proved to be too small and, during 1916, batteries on the Western Front were amalgamated, re-equipped and reorganised to make all field gun batteries up to six 18-pdr guns. A similar reorganisation in February 1917 saw all howitzer batteries made up to six 4.5-in. howitzers.

Brigades and divisions

The RA equivalent of a battalion was the *artillery brigade*, a lieutenant-colonel's command and a tactical, rather than administrative, grouping. In August 1914 RHA brigades consisted of two batteries, RFA of three batteries. Two RHA brigades were attached to the cavalry division of the BEF (plus a single battery to support the independent cavalry brigade). Late in 1914, two more cavalry divisions were raised, each supported by an RHA brigade.

RFA brigades were organised into *divisional artillery* (DA) under a brigadier-general – the division's Commander Royal Artillery or CRA. In August 1914 the divisional artilleries of the six divisions of the BEF each consisted of three 18-pdr brigades, a brigade of 4.5-in. howitzers, and an RGA heavy battery of four BL 60-pdr guns. On the outbreak of war, the 7th and 8th Divisions were formed. Each had an RHA 13-pdr brigade in place of one RFA brigade, two RGA batteries of four old QF 4.7-in. guns instead of the 4.5-in. howitzer brigade, and no 60-pdr battery. Three more divisions were formed in late 1914 (the 27th, 28th and 29th), by which time the divisional artillery was reduced to just three brigades of three four-gun RFA batteries. The two Indian divisions on the Western Front had three full-strength 18-pdr brigades each, but only a four-gun RGA 4.7-in. battery instead of a howitzer brigade.



The (highly unofficial) coat of arms of the 160th (Wearside) Brigade, RFA, delightfully reflects the preoccupations of this New Army field artillery unit. The 'supporters' are a horse (the 'hairy' around which the routine of the working day centred), and a negligée-clad, cheroot-smoking *fille de joie* (presumably the focus of off-duty activity), standing on a bulging moneybag. The crest features an open bottle of port and the escutcheon carries the diagonal 'bend sinister', the supposed mark of bastardy. The motto reads *Klepto* – 'I steal'! (By kind permission of the MOD Library Service)

39th (Deptford) Divisional Artillery 1916

174th Brigade, RFA
(18-pdr guns)
A Battery
B Battery
C Battery
D Battery
Ammunition Column

184th Brigade, RFA
(18-pdr guns)
A Battery
B Battery
C Battery
D Battery
Ammunition Column

179th Brigade, RFA
(18-pdr guns)
A Battery
B Battery
C Battery
D Battery
Ammunition Column

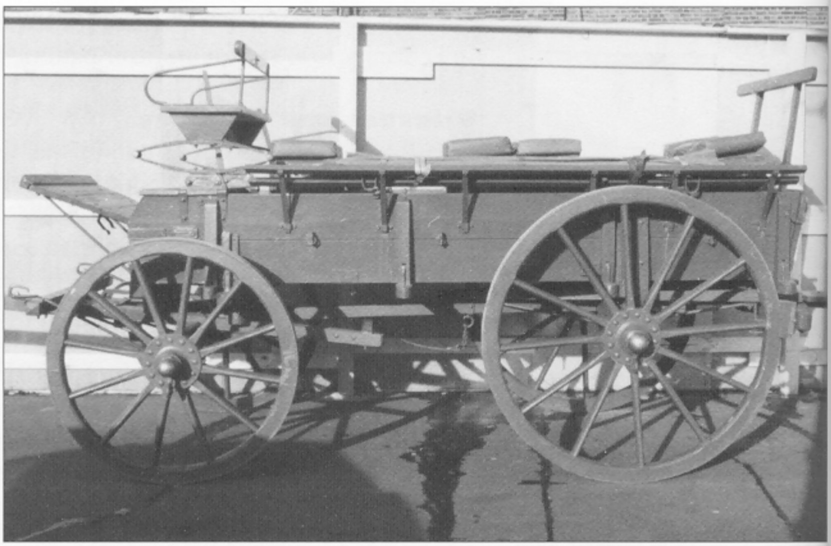
186th Brigade, RFA
(4.5-in. howitzers)
A Battery
B Battery
C Battery
D Battery
Ammunition Column

39th Divisional Ammunition Column

X/39, Y/39, Z/39 Medium Trench Mortar Batteries
(2-in. mortars, later 6-in. mortars)

V/39 Heavy Trench Mortar battery
(9.45-in. mortars)

In 1915 the divisional artilleries each gained batteries of four trench mortars (designated X, Y and Z Batteries), later re-organised into two batteries of six mortars (X and Y). Howitzer batteries and brigades were designated with an 'H' until May 1916, when the RFA reorganised, so that all brigades were formed of three field gun batteries and one of howitzers. Early in 1917 the divisional artilleries were reorganised, being reduced to two brigades, each of three 18-pdr field gun batteries and one 4.5-in. howitzer battery. The remaining brigades became *Army Field Brigades*, strategic reserves used wherever additional firepower was required. The Fourth Army field artillery, for example, consisted of one brigade of RHA (re-equipped with 18-pdrs), plus eight brigades of RFA.



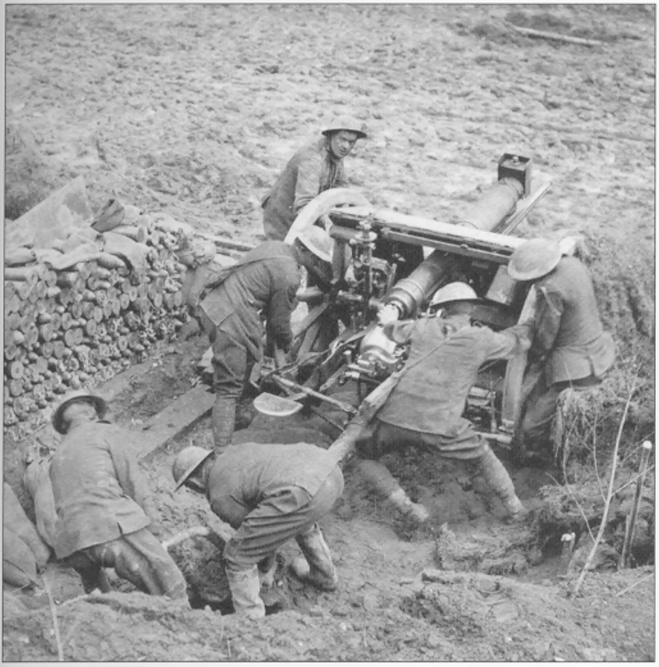
A 1917 General Service (GS) wagon Mk. X*. The GS wagon was the British Army's principal logistic vehicle from 1862 to the end of World War I. The Mk. X was the penultimate type, entering service in 1905. (Author's photograph, reproduced courtesy of Major J.M. Butler)

Ammunition columns

The provision of all natures of ammunition was a major challenge for an army equipped with QF artillery, magazine rifles and machine guns. In 1914 specialist Royal Artillery units, *Brigade Ammunition Columns*, commanded by a captain, were formed to maintain the supply of artillery ammunition and small arms ammunition (SAA). In 1916 the brigade ammunition columns were absorbed into *Divisional Ammunition Columns*, which were divided into echelons – 'B' echelon moved ammunition up from depots, 'A' echelon replenished the front-line troops. Where conditions were so bad that ammunition wagons could not move forward to the guns, ammunition was brought up on pack-saddles, eight rounds of 18-pdr or four rounds of 4.5-in. per horse, each horse led by a driver on foot. During the latter part of the war ammunition was sometimes pre-positioned on alternative battery positions. If unused, it was 'salved' and returned to the system, providing a fruitful source of 'short rounds' (shells falling short, on friendly troops) and 'prematures' (shells bursting too early).

DISTRIBUTION OF FIELD ARTILLERY AMMUNITION, 1914

	13-pdr	18-pdr	4.5-in.	60-pdr
Gun limber	24	24	12	–
Battery limbered wagons (2 per sub)	152	152	96	80
Brigade ammunition columns	220	76	48	40
Divisional ammunition columns	–	126	44	60
Total with fighting troops, per gun	**396**	**378**	**200**	**180**
Divisional ammunition park	150	150	80	70
Ordnance depots	454	472	520	250
Total in field, per gun	**1,000**	**1,000**	**800**	**500**



ABOVE **Positioning a QF 18-pdr field gun during the Battle of Arras, April 1917. An armoured oil tank is fitted to the front of the recuperator, to extend the life of the springs. (IWM Q5171)**

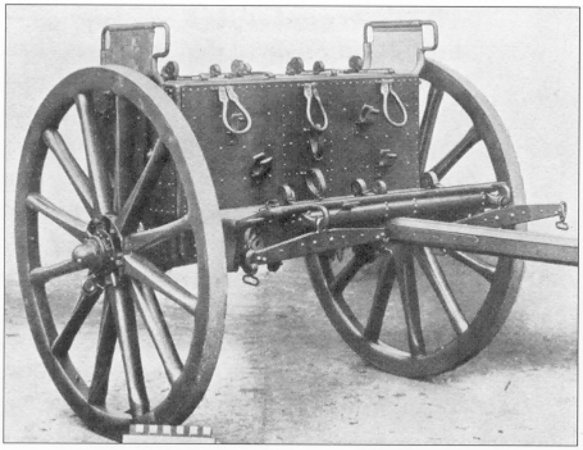
Battery organisation

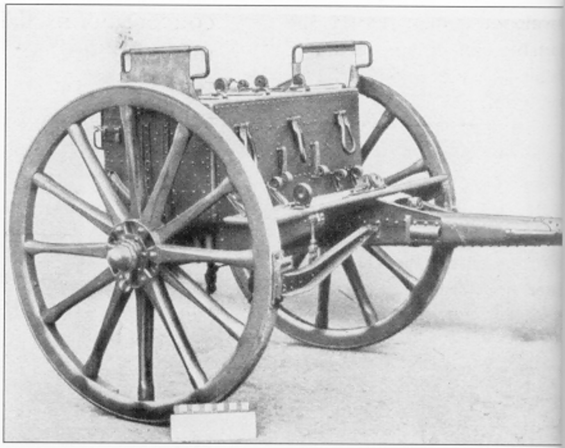
One wartime divisional artillery was described by its busy chaplain as consisting of some 3,000 men, dispersed over 40 locations, in an area – from the trench mortars at the extreme front, to the divisional ammunition column at the rear – as much as eight miles deep. Each battery, the chaplain noted, had an entirely separate character and was divided into two very different types of soldier – gunners and drivers – living in separate locations, several miles apart. Field batteries were divided into sections of two guns (or howitzers), with a subaltern (lieutenant) in command. A gun and its detachment, horses, drivers and two ammunition wagons was a *sub-section.* Each sub-section was designated with a letter (A to F in a six-gun battery) and commanded by a sergeant, the 'Number 1'.

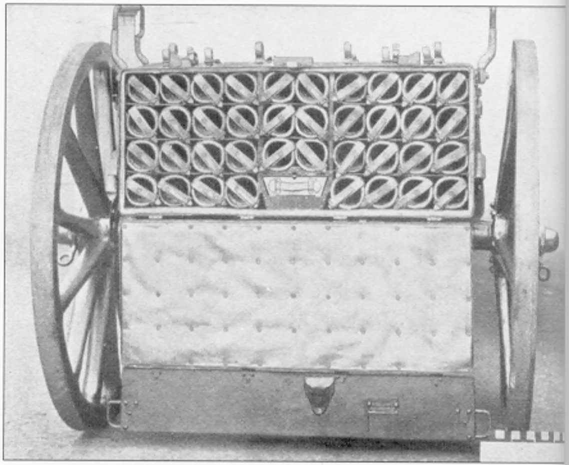
DUTIES OF AN 18-PDR GUN DETACHMENT

Number 1: In command.
Number 2: Limbers and unlimbers gun (with No. 3). Responsible for cradle clamping gear, range indicator and field clinometer. Operates breech mechanism. Removes breech and muzzle covers. Mans right wheel in action.
Number 3: Limbers and unlimbers gun (with No. 2). Responsible for dial sight, sight clinometer and sight cover. Lays for line and (with No. 2) lays for elevation. Fires the gun.
Number 4: Limbers up and unlimbers ammunition wagon (with Nos. 5 and 6). Plants aiming posts. Loads the gun. Mans left wheel in action. Responsible for drag ropes and wagon brake.
Numbers 5 & 6: Hook in and unhook ammunition team. Limber up and unlimber the wagon (with No. 4). Prepare and supply ammunition. No. 6 operates the fuse indicator. Mans the trail at 'run up'.
Numbers 7, 8 & 9: Reserves at wagon line. Assist with the supply of ammunition and replace casualties.
Number 10: 'Coverer' (takes over the detachment if Number 1 becomes a casualty) and second-in-command. Remains at the wagon line in charge of the sub-section's teams and wagons.

An 18-pdr field gun had a crew of ten, six of whom operated it in action. It was towed by a limber drawn by a team of six horses, with a driver riding the nearside horse of each pair. On reaching his gun's 'platform' (firing position), the Number 1 would order 'Halt, Action – front'. The team would advance until the gun was in position, where it would be unhooked by the Nos. 2 and 3, the limber moved forward, and the gun turned through a half-circle anticlockwise (or uphill, if on a slope) to face the enemy. The ammunition wagon (a limbered wagon, also drawn by a six-horse team) was then brought alongside the gun on the left, unhooked from its limber by Nos. 4, 5 and 6 and positioned parallel to the gun, with the dust cap of its axle one foot away from and one foot to the rear of the







dust cap of the gun axle. The teams and limbers then moved back to the wagon lines under the direction of the Battery Sergeant-Major (BSM).

On the Western Front wagon lines moved to the rear, away from the battery position, out of the reach of German artillery and where shelter, forage and water could be provided for the horses. Eventually they were miles behind the gun positions – which could mean several hours' travel on congested, mud-choked, shell-torn roads. As a result a 'forward wagon line' of limbers and teams might be established, ready to move the guns at short notice. Communication between the battery position and wagon line – which was under the authority of the *Battery Captain* ('the Captain') – was by telephone, or if that failed, 'mounted orderly' (a horseman). At the wagon line were to be found the BSM and Battery Quartermaster Sergeant (BQMS), the armourer staff sergeant, fitter, farrier, shoesmith, wheeler, and all the other various trade and administrative staff, as well as reserve gun detachment members (Nos. 7, 8, 9 and 10), and, of course, the horses, drivers and inevitable battery dogs. Apart from the ammunition wagons and limbers, batteries required GS (general service) Wagons, limbered GS Wagons, mess carts, water carts, light utility Maltese carts – plus whatever other transport could be salvaged from the bogged-down vehicles and dead horses that lined the roads, in order to carry the batteries' little luxuries – such as cooking stoves (with chimneys improvised from 18-pdr cartridge cases), beds, chairs, tables and, if very lucky, a piano.

Gun positions

The *Battery Leader*, the senior subaltern, was responsible for the battery position, freeing the *Battery Commander* (BC or 'the Major') to go forward to observe the enemy and direct fire. As the war progressed, field artillery fire missions became increasingly complex. The aim was to bring massed artillery fire to bear on the enemy's front line and reserve trenches, to cut his barbed wire, keep the defenders in their dug-outs, and prevent reinforcements from being brought forward: curtain fire, SOS lines,

ABOVE **Interior of the Mk. II Ammunition Wagon. The two-part tempered steel door has been dropped, protecting the gun detachment from small arms fire and shrapnel. The 38 Indian cane baskets each held a single 18-pdr round. (Author's collectio**

TOP LEFT **Limber, QF 18-pdr, Wagon, Mk. II. The wagon limber was similar to the carriage (i.e. gun) limber, but fitted with a larg ammunition box (38, as against 24 rounds). (Author's collection)**

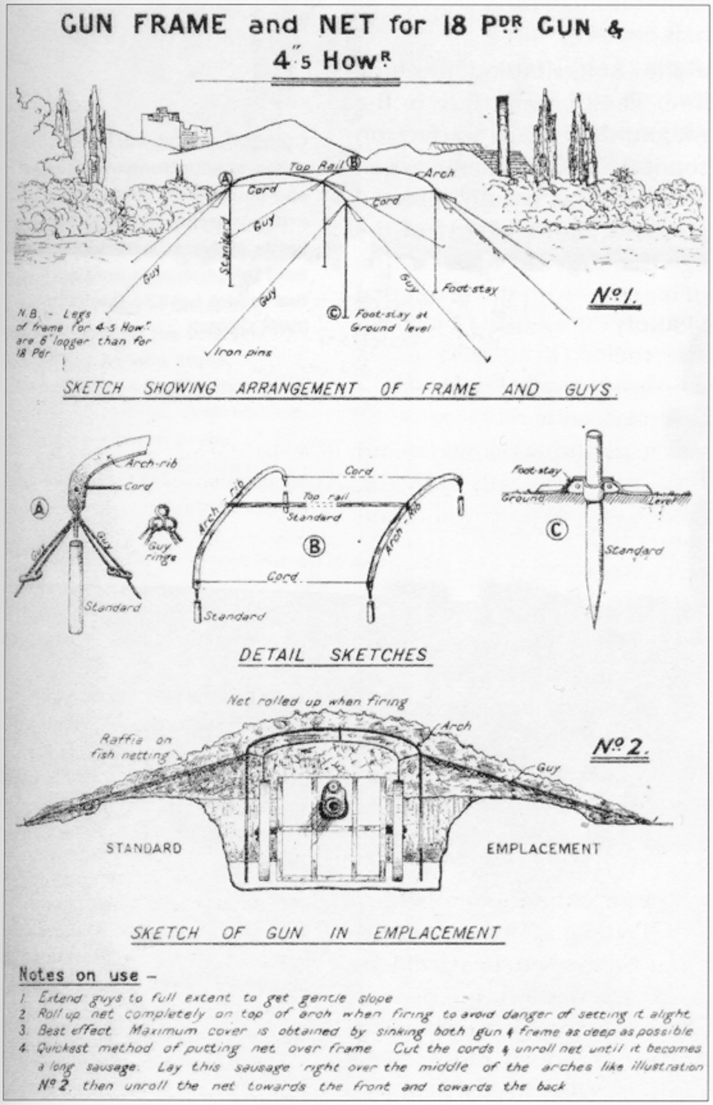
TOP RIGHT **Wagon, Ammunition, QF 18-pdr Mk. II. Ammunition wagons differed from limbers in being fitted with brakes (the brak handle was to the rear, under the ammunition box), and having a stubby hollow steel 'perch' in place of a wooden draught pole. (Author's collection)** concentrations, liaison, box, creeping, rolling and weaving barrages, timed missions and all manner of other tasks entered the field gunners' repertoire. Other, less conventional, tasks for the field artillery included bringing a single gun forward into the extreme front line to cut a path through the barbed wire entanglements, or providing anti-aircraft cover – one gun from each battery being tasked to fire shrapnel timed to burst at 400 feet over the British front line (necessitating some modifications to the firing platform). From late 1916, there were also designated 'anti-tank guns'. Tank ambush positions were very different from the usual firing platform, and, like the wire cutting, effectively removed one gun and detachment from the battery strength. This loss of firepower was serious, and obsolescent BLC 15-pdr guns were sometimes used, as they could be left permanently in position and batteries coming into the line had only to provide a detachment to operate them.

In the trenches of Gallipoli guns were dug into pits, with an ammunition wagon alongside – the wagons sandbagged on top and at the sides, and the guns' buffers wound thickly with rope to protect them from shell splinters (the vulnerable screw threads on the outside of the 18-pdr's recuperator had to be protected, as did the cylinder itself – as a dent could put the gun out of action).

On the Western Front, the 18-pdrs and 4.5-in. howitzers of the field artillery were merely the front row of an orchestra of artillery that went back through 60-pdrs, 6-in. howitzers, 9.2-in. howitzers, up to huge 14-in. railway guns. In addition to the dangers of enemy fire, 'friendly' heavy artillery shells regularly passed over the field gunners' heads, and prematures were a constant hazard. Gun positions were fortified, with guns at four-yard intervals in axle-deep pits, surrounded by belts of barbed wire. Camouflage – particularly from the air – was vital if counter-battery fire was to be avoided. Apart from natural foliage, 'fish nets' decorated with hessian or canvas scrim were used; later replaced by 'rabbit wire' (wire netting with a mesh of 1½–3in.), which was less of a fire hazard.

Some positions were very elaborate; 4.5-in. howitzer positions in the Vaux Valley in 1916 featured ten feet of overhead cover, and electric lighting of the gun pits and aiming posts. When a fire mission arrived at the battery telephone exchange, a signaller would

Developed in August 1916, the portable camouflage set for field artillery consisted of a 30ft x 30ft fish-net garnished with dyed raffia, supported on an iron frame. The Royal Engineers manufactured 12,816 field gun sets, and one was issued to every 18-pdr gun in action on the Western Front. Later wood was substituted for iron, and flammable raffia replaced by strips of canvas or scrim. Portable Gun Sets fell out of use from the end of 1917, gunners preferring to carry just the net. (Reproduced by kind permission of the Institution of Royal Engineers)


GUN FRAME and NET for 18 Pdr GUN & 4.5 How.r

Top Rail
Arch
Cord
Cord
Guy
Guy
Guy
Guy
Standard
Foot-stay
Foot-stay at Ground level
Iron pins
N.B. - Legs of frame for 4.5 How.r are 6" longer than for 18 Pdr
Nº1.
SKETCH SHOWING ARRANGEMENT OF FRAME AND GUYS.
Arch-rib
Cord
Guy
Guy rings
Standard
Cord
Top rail
Standard
Arch-rib
Arch-rib
Cord
Standard
Foot-stay
Ground
Level
Standard
DETAIL SKETCHES
Net rolled up when firing
Raffia on fish netting
Arch
Guy
Nº2.
STANDARD
EMPLACEMENT
SKETCH OF GUN IN EMPLACEMENT

Notes on use –

1. Extend guys to full extent to get gentle slope
2. Roll up net completely on top of arch when firing to avoid danger of setting it alight
3. Best effect. Maximum cover is obtained by sinking both gun & frame as deep as possible
4. Quickest method of putting net over frame. Cut the cords & unroll net until it becomes a long sausage. Lay this sausage right over the middle of the arches like illustration Nº2. then unroll the net towards the front and towards the back

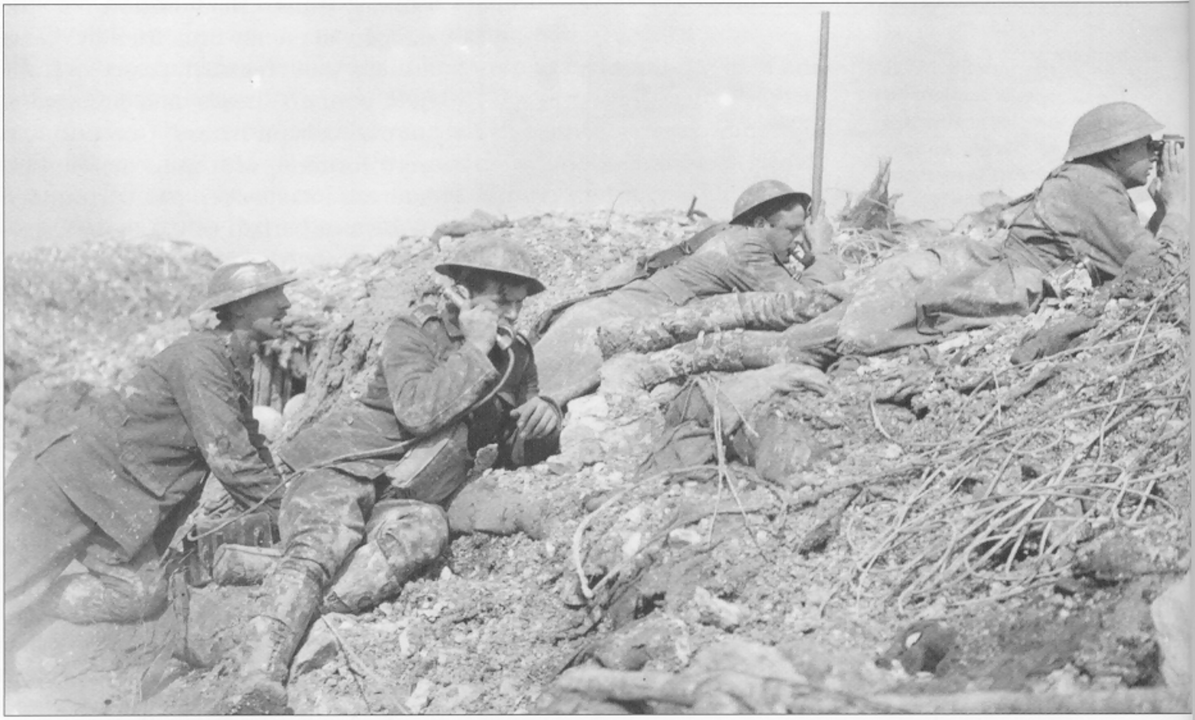
pass the fire orders to the gun sections by megaphone, the sentry would switch on the electric lighting and the guard rouse the gun detachments to action. The men lived in shell-proof chambers and passages 30–40 feet below the surface. In contrast, at Pilkem Ridge in October 1917 two batteries squeezed into a 50-yard space, with the guns perched on rickety platforms of salvaged timber in a sea of mud and shell holes.

Army and Corps Barrages, Ypres, 1917

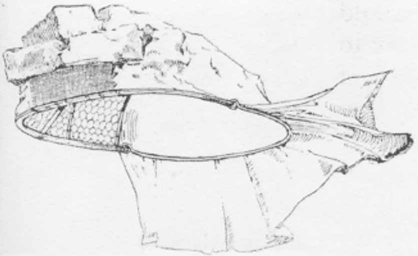
'A' Barrage:	One-third to a half of all 18-pdrs, firing shrapnel.
'B1' Barrage:	Remainder of 18-pdrs, firing HE, 200 yards in front of A.
'B2' Barrage:	4.5-in. howitzers, 200 yards in front of B1.
'C' Barrage:	Machine guns (Vickers .303), 200 yards in front of B2.
'D' Barrage:	Medium howitzers (6-in.), about 200 yards in front of C.
'E' Barrage:	Heavy howitzers (9.2-in.), in front of D.

Observation posts

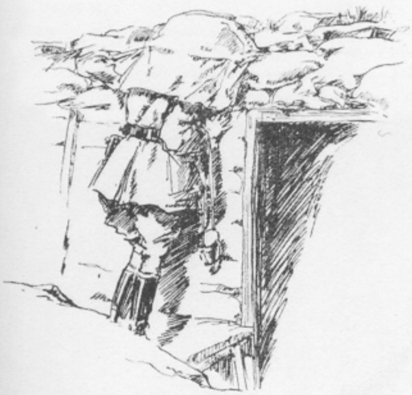
'Fighting the battery' was the BC's responsibility. At its simplest, this took the form of directing fire from the gun line. The open warfare in the early stages of the Western Front campaign, and the mobile warfare on other fronts, such as in Palestine and Mesopotamia, were characterised by this sort of action. On the Western Front fire was usually directed from 'advanced observation posts' (OPs) some distance ahead of the gun position, enabling the battery to engage the target by indirect fire. The BC could only call on fire from his own battery – with the result that good observation positions became crowded with OP teams.



Cuthbert Crater, April 1917. RFA officers, with trench periscope and binoculars, direct the artillery preparation for the battle of Arras. A Royal Engineer field telephonist is passing fire orders back to the battery. (IWM Q5095)



Portable Beehive O.P. unarmoured (weight about 10 lb.). Showing "brick" camouflage. Any surroundings can be similarly imitated.



Portable Beehive O.P. in use.

The Portable Beehive OP was devised by the Royal Engineers' Camouflage Parks to assist artillery officers in observing the enemy. Note the officer's full-skirted service dress, riding breeches and leather Sam Browne equipment. (Reproduced by kind permission of the Institution of Royal Engineers)

The OP communicated with the command post at the battery position by line (telephone or buzzer) or visual means (heliograph, signal flags or 'Lucas' daylight signalling lamp), the favourites being voice telephone or Lucas lamp. Morse code was used with the buzzer, heliograph and lamp, morse or semaphore codes with signal flags. Telephone line laid on or above the ground ('surface' or 'air' lines) proved vulnerable to enemy artillery fire and, from the spring of 1915, static warfare brought the increased use of the 'bury' or buried line, in its own trench, which could be six feet deep. During the most intense periods of trench warfare, pairs of signallers would be posted in dug-outs, each pair responsible for keeping a 500-yard stretch of D3 ('Don Three') telephone line intact under bombardment (at Gallipoli, 15th Brigade, RFA, lost nine telephonist line-layers killed in a day). Human chains of orderlies were sometimes used to pass messages, and primitive wireless (radio) was also used, most notably for aerial observation. If all else failed, a rifle grenade flare (bursting into two white and two green stars, for example) was fired to call down 'SOS fire'. If the guns lost contact with the OP completely, they could only fire on pre-registered 'Night Lines' or 'SOS Lines' and hope for the best.

Standing Orders for OPs, 2nd Brigade, RFA, March 1918

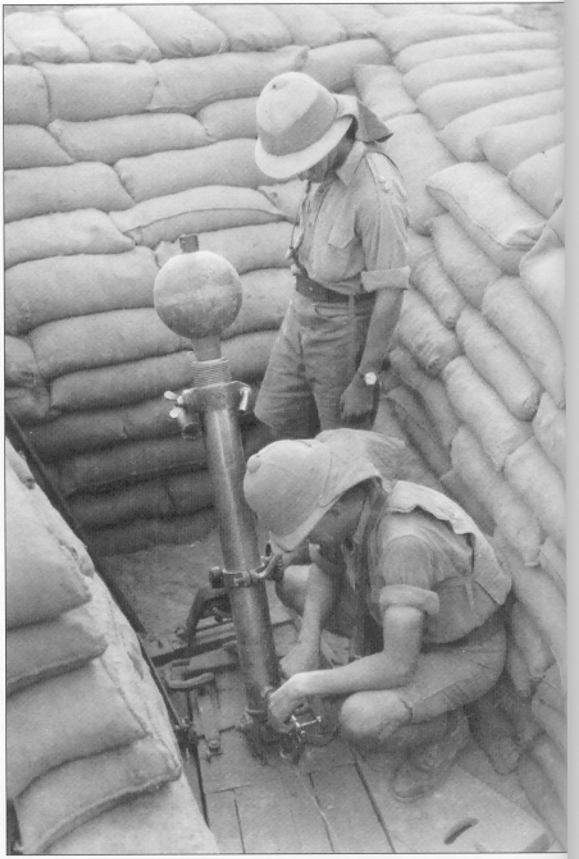
1. Every OP to be furnished with:
   a. Diagram of communications.
   b. Map showing arcs of fire of all 6-in. howitzers and 60-pdrs firing over our zone (batteries to keep map up to date).
   c. Log book (marked with name of OP).
   d. Pointer [used when reporting gun flashes and other targets to the heavy artillery, as lateral angles from True North].
   e. List of Code Calls.
   f. Panorama or sketch of the view from the OP in the logbook.
   g. Beware Notice [a printed notice; 'Beware! The enemy can hear you.'].
2. Night OP to be provided with a rifle and SOS rifle grenades.
3. NCO and personnel to be armed.

Trench mortars

At the extreme forward edge of the British line were the trench mortar (TM – 'Toc Emma' in the contemporary phonetic alphabet) batteries. Mortars, short-range weapons capable of throwing a heavy shell over the enemy's wall, or into his trench, had always been popular in siege warfare. Unsurprisingly, in 1915 on the Western Front, the requirement re-emerged, and was met by the British with a series of simple weapons throwing very large bombs a few hundred yards – the British 2-in. mortar, for example, fired a 60-pound 'toffee-apple' HE shell and was considered very accurate at a range of 350 yards. Trench mortars were initially manned by joint infantry/artillery detachments; eventually 3-in. Stokes mortars became the responsibility of the infantry, medium (2-in. and 6-in.) trench mortars the RFA, and heavy (9.2-in.) mortars, the RGA.

To compensate for their short range, trench mortars were positioned very far forward, typically within 150 yards of the front line. If the front line was too far from the enemy, mortar positions might be at the end of their own 'sap' (a zigzag trench heading out from friendly lines towards enemy positions). At Thiepval, in preparation for the Somme offensive of 1 July 1916, Y/32 Battery extended 'Hammerhead' sap and 'Left Hand' sap right up to the German wire, to enable their 'guns' (2-in. mortars, with a maximum range of 500 yards) to fire into the German support trenches.

A medium TM position was commonly a 6ft square hole, about 9ft deep, with a screen of sacking over the top as camouflage. The position would be heavily sandbagged, with alcoves for ammunition and exits down to deep dug-outs, where the detachments lived. A battery might prepare several alternative firing positions, complete with 'beds' (wooden platforms dug and fixed into the ground, from which the mortars were fired). Mortar bombs had to be manhandled up to the front line, with the less-than-enthusiastic assistance of the infantry. TM's effectiveness, coupled with short range and almost total immobility, tended to make them the target of furious counter-bombardment – which further served to upset neighbouring infantry. Trench mortar batteries lacked organic transport, the 'guns' being moved by motor lorry when required. The batteries had no role in mobile warfare, and whenever the situation became fluid either acted as fatigue parties or, if they were particularly fortunate, were allocated captured German field artillery for as long as the ammunition supply lasted.



2-in. trench mortar, Mesopotamia 1917. The 'toffee-apple' bomb has been loaded, and a gunner is loading the firing tube – a powerful .303-in. blank round – into the firing mechanism (a cut-down Lee-Metford rifle action). The solid steel 'stick' of the 'toffee-apple' had an alarming tendency to re-trace its trajectory when the bomb detonated. (IWM Q24286)

THE GUNS

Artillerymen referred to all their equipments as 'guns', including howitzers and mortars. However, a *gun* is correctly defined as an artillery piece that starts with its barrel near the horizontal and elevates the muzzle to achieve greater range. A *howitzer* starts with its barrel at around 45 degrees, or more, and depresses it to lengthen the range. A howitzer also has the option of a variable charge – made up of separate bags inserted in the cartridge – to vary the range further for any given angle of elevation. *Mortars*, in the context of World War I British field artillery, were simple muzzle-loading (ML) weapons, which operated with the barrel near vertical, depressing towards 45 degrees to achieve greater range. Guns tended to be long-barrelled, with a high muzzle velocity, howitzers and mortars short-barrelled, with a low muzzle velocity.

Ammunition

BL ordnance used separately loaded ammunition, (a primer tube, bagged propellant charge and shell). QF ordnance used a brass cartridge and a shell, either 'fixed', or as two 'separate loading' components. The usual propellant was cordite, but US-made ammunition (purchased extensively during the war) used nitro-cellulose powder. Older guns were provided with shrapnel shell and case shot (or 'canister'), both of these being anti-personnel rounds containing hundreds of lead alloy 'bullets'. Case shot broke up in the bore, turning the gun into a giant shotgun. During the Boer War, case shot proved ineffective against infantry armed with long-range rifles, and as similar effects could be achieved by setting shrapnel fuses at 'zero', case shot was not manufactured for the new generation of QF artillery. Initially, high explosive ammunition was only provided for the field howitzers, but an 18-pdr HE round proved successful during 1914 and entered production. The original 'HE' was lyddite, but early 18-pdr shells contained pure trinitrotoluene (TNT), later replaced by a TNT/amatol mixture in varying proportions. Other specialist ammunition eventually included star shell (4.5-in. howitzer), smoke (18-pdr and 4.5-in.), gas (18-pdr, 4.5-in. and 60-pdr) and incendiary (18-pdr and 4.5-in.). A representative selection is listed below with each gun.

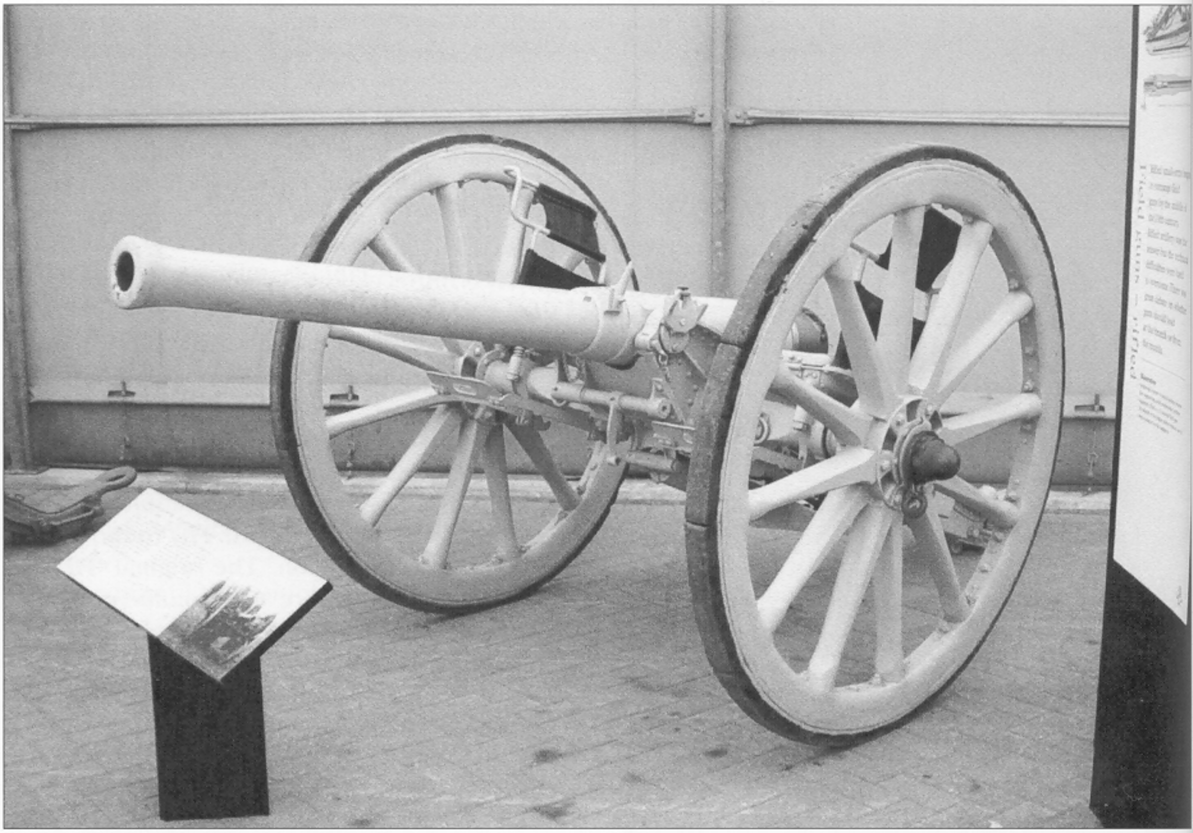
Nomenclature

Traditionally, guns were described by the nominal weight of their projectile (18-pdr, for example), howitzers by the diameter of the projectile in inches (4.5-in.), but there were exceptions. Different types of ordnance (a complete barrel and breech mechanism) firing similar-sized projectiles were differentiated by weight, for example the 12-pdrs of 6 hundredweight (cwt) or 8cwt. Weights were recorded on the breech ring in tons (if applicable), hundredweights (cwt), quarters (qr) and pounds (lb). The same ordnance might be mounted on different carriages (a 'carriage' included the carriage itself, plus laying, sighting and recoil mechanisms), so both are specified in the nomenclature – Ordnance QF 18-pdr gun Mk. IV on carriage field 18-pdr Mk. III, for example. Carriage and ordnance combined form an 'equipment'. In the following listing 'equipments' are in chronological order, by date of introduction. Where a variant differs widely from the original, such as the BLC 15-pdr, it has its own entry.

BL 15-pdr (formerly 12-pdr 7cwt) field gun

By 1914 the BL 15-pdr was obsolete and had mainly been replaced by the QF 18-pdr, although it was still to be encountered in training establishments and overseas. A modernised variant, the BLC 15-pdr, played an important role in the field artillery, as did the unrelated QF 15-pdr 'Ehrhardt', and it is often very difficult to determine which '15-pdr' contemporary authors are referring to.

The Royal Artillery first adopted this equipment as a 12-pdr breech-loading gun of 7cwt in 1885 – the same gun being issued to horse and field artillery. In 1892, following the introduction of cordite to replace



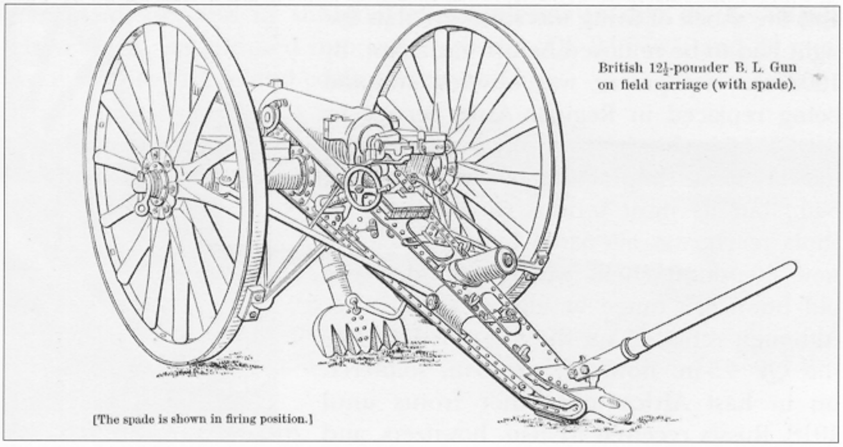
BL 15-pdr field gun. Note axletree seats, and the barrel mounted directly onto the carriage. Compare this with the modified BLC 15-pdr illustrated on page 36. (Author's photograph, reproduced by kind permission of Bapty & Co. Ltd)

gunpowder as propellant, the Biddulph Committee determined that a 15-pound shell could be fired from the BL 12-pdr without modification, and the gun then became the BL 15-pdr (the service shrapnel shell actually weighed 14lb fused and filled). The equipment was modified in 1899, to increase its rate of fire, by fitting a recoil-absorbing spade, in an inverted T-shape, which hung from the centre of the axle and was connected to a powerful spring in a cylinder in the trail. The action of the spade actually increased 'jump' (the jolt given to the equipment on firing), and ensured the need to re-lay between shots, nevertheless, the conversion did increase rate of fire, as the gun did not need to be 'run up' to its firing position. Mk. II and IV 15-pdrs featured single-motion breechblocks in place of the original three-motion type.

From 1904, the BL 15-pdr began to be replaced in Regular Army service by the QF 18-pdr, but many were rebuilt as an ersatz QF gun, the BLC 15-pdr, to equip the Territorial Force.

SPECIFICATION

Nomenclature:	Ordnance BL 15-pdr gun Mk. I, II or IV on carriage 15-pdr Mk. IV
Weight of equipment:	19cwt 1qr 12lb
Ammunition type:	separate loading BL
Calibre:	3-in.
Projectile type and weight:	shrapnel, 14lb; canister
Maximum range:	6,000 yards


British 12½-pounder B. L. Gun on field carriage (with spade).
[The spade is shown in firing position.]

Contemporary drawing of the BL 12-pdr field gun on a Carriage Mk. I. The caption, technically correct, describes the gun as a '12½-pdr', although the official nomenclature was '12-pdr'. (Author's collection)

BL 12-pdr 6cwt field gun

The BL 12-pdr 6cwt was obsolete by the start of World War I, having been replaced in service with the horse artillery by the QF 15-pdr and the QF 13-pdr. Examples probably remained as training weapons and with garrisons, particularly in the colonies (note: '12-pdrs' ashore at Gallipoli were naval 12-pdr 8cwt guns, see below).

The RHA adopted the BL 12-pdr 7cwt gun in 1885 – the same gun issued to the RFA. This proved too heavy for horse artillery, and in 1892 – following the introduction of cordite propellant – the opportunity was taken to develop a lighter version, better suited to horse artillery requirements. The result was the BL 12-pdr of 6cwt. In 1899 an effort was made to improve the performance of the 12-pdr 6cwt, like the BL 15-pdr, by attaching a recoil-absorbing sprung spade to the carriage. The gun was rendered obsolete by the arrival of the Quick Firing 15-pdr 'Ehrhardt' in 1901.

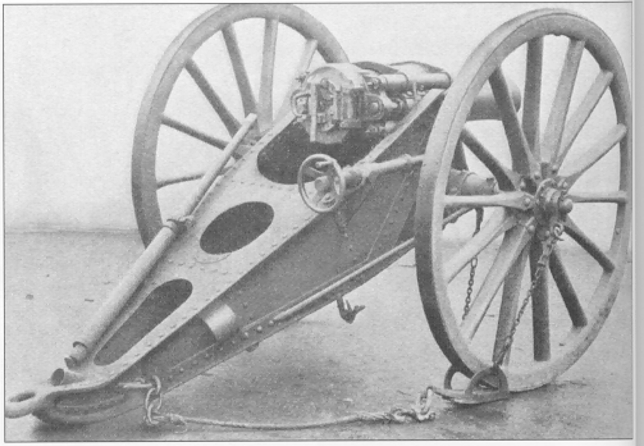
SPECIFICATION	
Nomenclature:	Ordnance BL 12-pdr gun Mk. IV on carriage 12-pdr Mk. I or II
Weight of equipment:	17cwt 3 qr 20lb
Ammunition type:	separate loading BL
Calibre:	3-in.
Projectile type and weight:	shrapnel, 12.5lb; canister
Maximum range:	6,000 yards

BL 5-in. field howitzer

The BL 5-in. howitzer served with the RFA from 1896 to 1908, and with TF field artillery batteries before and during World War I.

The re-introduction of field howitzers (absent since the adoption of rifled field guns in 1860) was prompted by the decision to concentrate on shrapnel as the ammunition for field guns. A battery of BL 5-in. howitzers was notably successful at Omdurman in 1898 and, although their tactical deployment was still imperfectly understood, howitzers firing 'lyddite' high explosive shells greatly impressed British troops during the Boer War.

The barrel of the 5-in. howitzer was carried in a cradle, with hydraulic buffers and recuperator springs, which permitted it six inches of recoil. Nevertheless, the carriage had to be immobilised in action with drag shoes, and the shock of firing was so severe that the sight had to be removed before each shot. By 1908 the equipment was obsolescent, and being replaced in Regular Army service by the QF 4.5-in. howitzer, the BL 5-in. passing to the TF. It was impractical to modernise the 5-in., but its most serious shortcoming, its short reach, was alleviated by introducing a new 40-pound shell, which extended the old howitzer's range by almost 2,000 yards. Although replaced on the Western Front by the QF 4.5-in. howitzer, the 5-in. soldiered on in East Africa and other fronts until 1918. Russia received 57 5-in. howitzers, and 18 were sent to Italy. A similar equipment was produced for the Indian Army, in 5.4-in. calibre; its wartime service was chiefly in training, although a few saw active service in Mesopotamia.

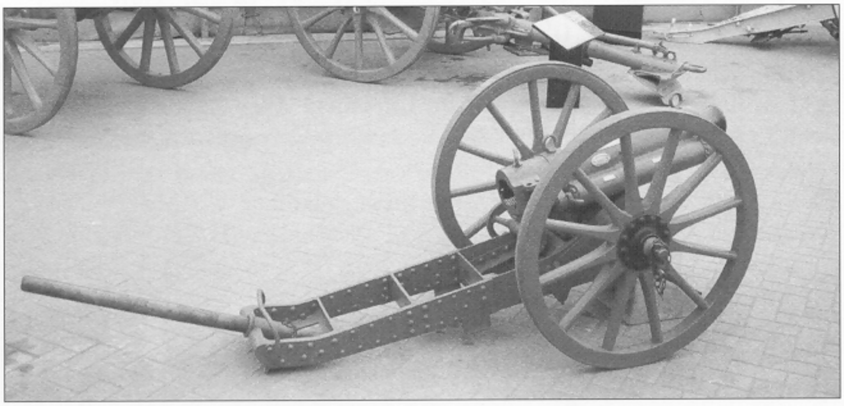

Drag shoes were required to immobilise the BL 5-in. howitzer, as its primitive recuperator was ineffective. (Reproduced courtesy of RAHT)

SPECIFICATION

Nomenclature:	Ordnance BL 5-in. howitzer Mk. I on carriage field BL 5-in. howitzer Mk. I
Weight of equipment:	1 ton 3cwt 3qr 13lb
Ammunition type:	separate loading BL
Calibre:	5-in.
Projectile type and weight:	HE, initially of 50lb, later 40lb
Maximum range:	50lb HE 4,800 yards; 40lb HE 6,500 yards

QF 2.95-in. mountain gun (pack howitzer)

On its introduction in 1897 the QF 2.95-in. represented the very cutting edge of artillery design. A 75mm 'Quick Firing' mountain or 'pack' howitzer manufactured commercially by Vickers, Sons and Maxim, it was the first British mountain gun to be fitted with a hydraulic buffer. However, like the other QF guns of its generation it was more accurately described as 'rapid fire', and recoil had to be checked by securing the wheels with ropes. Adopted by the Egyptian Army, the West African Frontier Force and the US Army, the 'Millimetre Gun' proved well suited for expeditionary warfare – firing a 12½-pound shell, or an 18-pound double shell. The British Army regarded it as too bulky and heavy for


A QF 2.95-in. mountain gun (breechblock removed), on display at HM Royal Armouries, Fort Nelson. (Author's photograph, reproduced by kind permission of Bapty & Co. Ltd.)

mountain use, and its shrapnel effect inferior to that of the 10-pdr. However, it was adopted into service as the 'QF 2.95-in.', and 30 guns were acquired to defend coaling stations.

SPECIFICATION	
Nomenclature:	Ordnance QF 2.95-in. gun Mk. I on carriage mountain QF 2.95-in. Mk. I
Weight of equipment:	829lb
Ammunition type:	fixed QF
Calibre:	2.95-in.
Projectile type and weight:	shrapnel, 12.5lb; or 18lb double shell
Maximum range:	4,825 yards

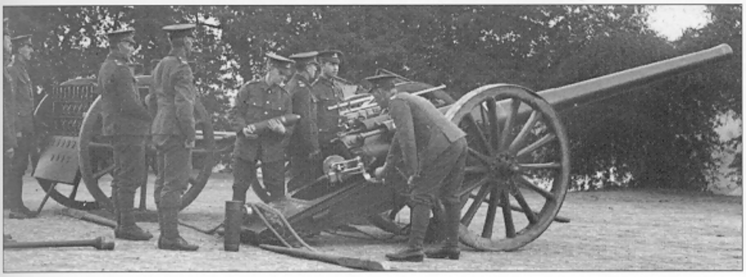
QF 4.7-in. field gun

The QF 4.7-in. was an extemporised heavy field gun that served from the Boer War into World War I, despite the fact that, by 1914, a better alternative, the BL 60-pdr, was available.

In South Africa in October 1897, there was an urgent need for a British heavy field gun. Not least among the many inadequacies of the BL 12-pdr and BL 15-pdr, was the fact that Boer field guns outranged them. Furthermore, the Afrikaners were willing and able to deploy guns of up to 15.5cm calibre as field artillery – adding a heavy shell to the advantage of long range. An immediate solution was to take ashore 12-pdr and 4.7-in. naval guns from HMS *Powerful*, *Terrible* and *Monarch*, mounted on wood-and-iron carriages, designed by the dynamic and resourceful Captain Percy Scott, RN. Already in service with the Army as a coastal defence gun, the 'Four-Point-Seven' now entered service as 'heavy field artillery', manned initially by coastal defence companies. In 1903 three siege companies of the Royal Garrison Artillery were equipped with mobile 4.7-in. guns as heavy field artillery. Two field carriages were produced for the gun – the Carriage Travelling QF 4.7-in. Mk. I and the Carriage Travelling Converted, QF 4.7-in. Mk. I, the former newly built, the latter converted from carriages of the obsolete 40-pdr RML (Rifled Muzzle Loader). Both types of carriage combined oil buffers and a spring recuperator with an axle-mounted recoil spade, similar to that used on the BL 15-pdr.

The QF 4.7-in. was a makeshift, decidedly heavy and awkward for the power of its shell, and with a marked tendency for the trail to 'dig in'. Nevertheless, it became, in the minds of the press and general public, the last word in artillery. There was also, following their performance in the Boer War, great enthusiasm for the Volunteers. In February 1900 the Secretary of State for War announced that the Volunteers were to receive the '4.7-in. guns which have done such excellent service in South Africa.' Parliament swiftly approved funding to re-equip the Volunteers with the 'guns specified' – 30 batteries of 4.7s in 1902 and another 30 in 1903. Thus, although the modern 60-pdr was in development, a grateful nation ensured that the volunteers received the 'Four-Point-Seven', and it remained the heavy field gun of the new Territorial

Gun drill with the QF 4.7-in. gun at Woolwich. The combination of short trail and long barrel caused the gun to 'dig in' when firing. For drill purposes, the limber has been placed alongside the gun to represent an ammunition wagon. (IWM Q33659)



Force following Haldane's reforms. During 1914–15, 4.7-in. guns saw extensive action on the Western Front, particularly used, alongside 6-in. guns, in the counter-battery role. By May 1915 many of the 4.7s were worn out, some 1,000 rounds beyond their barrel lives. Although there was an urgent need to replace them, 4.7s were still in service with the heavy batteries during the Somme battles of the second half of 1916. In 1917 the 'Four-Point-Seven' finally passed out of service after a long, distinguished and rather unexpected career.

SPECIFICATION

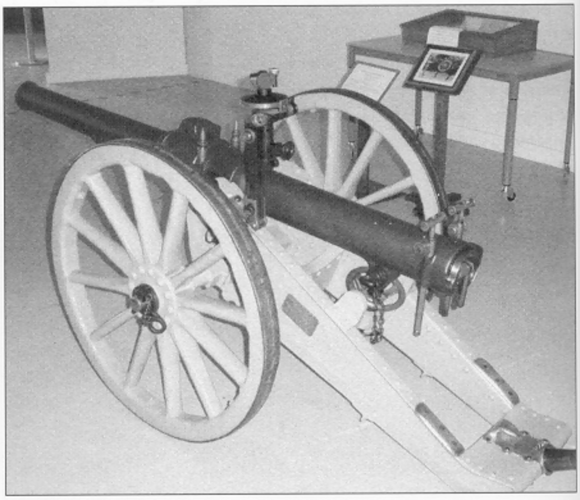
Nomenclature:	Ordnance QF 4.7-in. 'B' gun on carriage travelling QF 4.7-in. Mk. I
Weight of equipment:	3 ton 15cwt 19lb
Ammunition type:	separate loading QF
Calibre:	4.7-in.
Projectile type and weight:	HE, 46lb 9oz; shrapnel; gas
Maximum range:	10,000 yards

BL 10-pdr mountain gun

The BL 10-pdr was an obsolescent mountain gun that remained in service, particularly with the Territorial Force and colonial troops, during World War I.

The dire performance of mountain artillery in South Africa nearly resulted in its extinction as a British artillery arm. The little 2.5-in. rifled muzzle loader (Kipling's 'Screw Gun') was outranged by virtually everything on the battlefield – and the white smoke of its black powder charges made it an inviting target. In 1901 a jointed BL 10-pdr gun – scarcely more than a breech-loading, cordite-charged, version of the RML 2.5-in. – was approved for service. Although an improvement on the 'Screw Gun', the BL 10-pdr still left the British mountain artillery – in the absence of any form of buffer and recuperator – a design generation behind the horse and field artillery. This was finally remedied by further modification to create the BL 2.75-in. (*see below*), approved for service with the Regular Army mountain batteries in 1911, but it was three years before the new gun actually entered service, and the 10-pdr was still the issue mountain gun in 1914.

A mountain artillery brigade equipped with 10-pdrs replaced one field artillery brigade in the TF Highland Division (Highland ponies were used instead of mules and, these being less suited than mules to carrying the guns, the 10-pdrs were fitted with shafts). Argyll and Ross Batteries, 1/4th Highland Mountain Brigade, RGA (TF), landed their guns at Gallipoli, where the 10-pdr's size and design enabled them to be brought forward into the trenches, to engage Turkish positions at close range. The 10-pdr was also used successfully in Southwest Africa. In Egypt, in 1916, No. 10 Section, RFA, was formed to provide artillery support for armoured cars on desert raids against the Turks (including, from November 1917, Lawrence of Arabia's operations with Arab



Restored BL 10-pdr mountain gun on display at Firepower, the Museum of the Royal Artillery, Royal Arsenal, Woolwich, London. The barrel is unpainted, with a chemically 'browned' finish. (Author's photograph, reproduced courtesy of RAHT)

irregulars). The section travelled in six Talbot tenders (light trucks), two of which carried their BL 10-pdr guns.

SPECIFICATION

Nomenclature:	Ordnance jointed BL 10-pdr gun Mk. I on carriage mountain BL 10-pdr Mk. I
Weight of equipment:	874lb
Ammunition type:	separate loading BL
Calibre:	2.75-in.
Projectile type and weight:	shrapnel, 10lb; HE
Maximum range:	shrapnel 3,700 yards, HE 6,000 yards

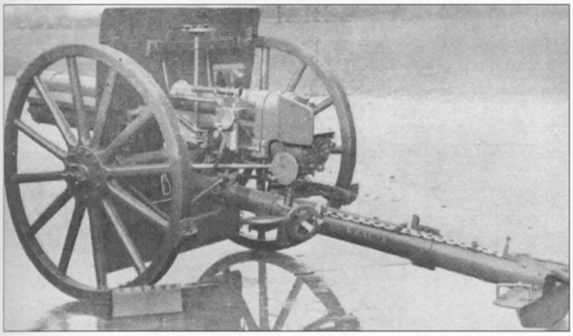
QF 15-pdr field gun '*The Ehrhardt*'

The 'Ehrhardt' was a 15-pdr Quick Firing field gun of German commercial manufacture adopted as a stopgap in 1901 and still in service, in a modified form, with the Territorial Force horse artillery batteries during World War I.

In 1900, in the absence of a suitable British-made equipment, efforts were made to source a genuine QF field gun overseas. A Royal Artillery officer, visiting the German engineering firm Rheinische Metallwaaren und Machinenfabrik, was astonished to find a 15-pdr field gun, the carriage of which stood quite stationary when the gun was fired (amazingly, a coin placed on the wheel remained there). This was achieved by allowing the barrel to recoil almost its full length in a buffered cradle – known as 'long recoil'. To make firing still smoother, a sprung telescopic trail was fitted. The performance of the German gun demonstrated that the true QF field gun was achievable – and that the rumoured performance of France's *Soixante-Quinze* was probably not an exaggeration. Anti-British sentiment was running high in Germany at the time. In conditions of absolute secrecy, an order was placed for the complete field artillery equipment of an army corps – 15 batteries, plus three in reserve, amounting to 108 guns, 275 limbers, 162 ammunition wagons, 54 forge, store and other wagons, and 54,000 rounds of ammunition (in British service the gun fired the same 14lb shrapnel shell as the BL 15-pdr field gun). In 1901, and only when the entire order had been safely delivered, was 'The Aldershot Army Corps' revealed.

It was estimated that adoption of the QF 15-pdr (which became known by the name of its designer as 'The Ehrhardt') saved Britain between five and ten years of development. Purchase of the guns gave British artillerymen the opportunity to experience the advantages and shortcomings of QF field guns (they required much more careful maintenance and handling than the BL guns). But the gun had serious defects – it was hand-crafted, with the consequence that spares and parts from one gun would not fit another. The telescopic trail was a weakness, and the unconventional all-metal wheels had to be replaced. The QF 15-pdr was never adopted by the British Army in general, but was used to gain experience, on the basis of which the specifications for new British field guns were drawn up. In 1908 it became the equipment of the TF horse artillery batteries. The carriages of TF Ehrhardts were modified by pinning the telescopic trail in the closed position, removing the axletree seats, fitting a shield, a traversing indicator, and a

QF 15-pdr 'Ehrhardt' field gun on carriage Mk. I*. Compare this version to the gun as originally purchased, illustrated on page 7. (Reproduced courtesy of RAHT)



rocking bar sight and mounting for the No. 6 sighting telescope. The resulting carriages were designated Carriage Mk. I*. Unmodified Ehrhardts (Carriage Mk. I) continued to serve, but as 'movable armament' in fortifications. One TF Ehrhardt battery went to France in 1914 and others to Egypt. During the war the gun was replaced by the QF 13-pdr and 18-pdr. Some surplus Ehrhardt guns were mounted as defensive armament on merchant ships.

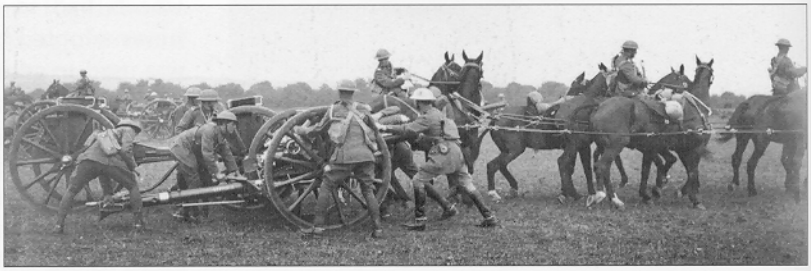
SPECIFICATION	
Nomenclature:	Ordnance QF 15-pdr gun Mk. I on carriage field QF 15-pdr Mk. I*
Weight of equipment:	20cwt 1qr 4lb
Ammunition type:	separate loading QF
Calibre:	3-in.
Projectile type and weight:	shrapnel, 14lb; canister
Maximum range:	6,400 yards

QF 13-pdr field gun

The QF 13-pdr field gun was the equipment of the Royal Horse Artillery throughout World War I, but after a promising start had a less distinguished career than the closely related QF 18-pdr. It has, though, the distinction of being the only gun in this book to remain in service with the British Army.

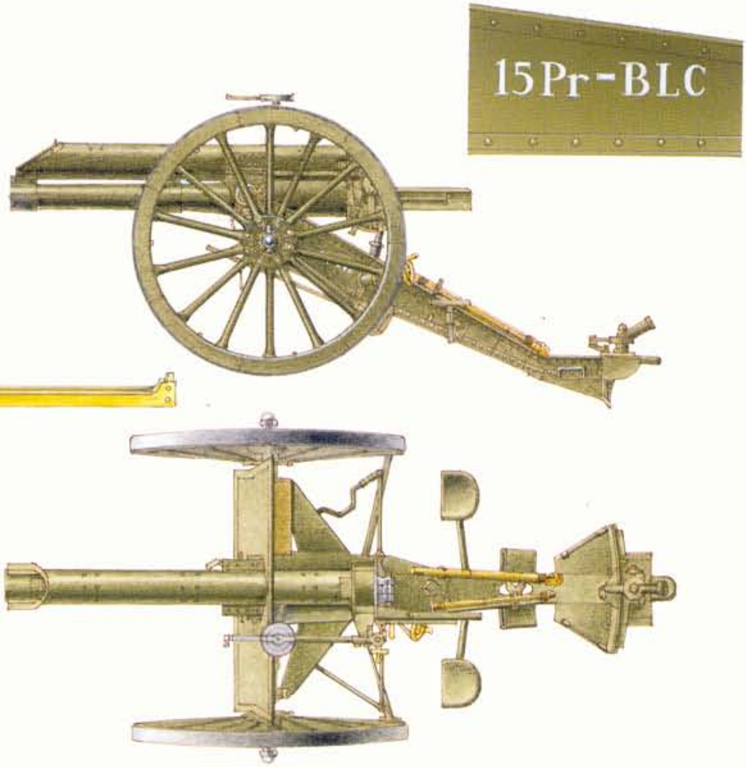
In 1901 an Equipment Committee was formed, to determine the 'Conditions' (specifications) for new QF field guns. The committee asked the potential users of the guns for their views, and then used these as a basis for a specification – the first time a requirement had been issued in this way. Several manufacturers submitted designs. None entirely satisfied the specification; however, all had merit, and in a further departure from tradition, the committee persuaded them to allow the best aspects of each design to be combined in a composite equipment. The new guns – broadly an Armstrong gun in a Vickers recuperator on a Royal Ordnance Factories carriage – were genuine 'Quick Firers', using the 'long recoil' principle (the barrel being allowed to recoil almost its entire length) and came in two versions, a 13-pdr for the horse artillery and an 18-pdr for the field artillery. The guns were successfully trialled in 1903 and, once axletree seats were removed from the 18-pdr design, were virtually identical. Both were designed for direct fire with shrapnel, the 13-pdr proving the more accurate and easier to manhandle. Shortly before the designs were to be accepted it was suggested that the 18-pdr be abandoned in favour of the 13-pdr for both horse and field, using a 14-pound shell, with the next calibre up being the 'heavy field' batteries. No agreement could be reached between the experts, and the matter was put before Prime Minister Balfour, who decided in favour of the original arrangement.

When finally ordered, on Christmas Eve 1904, the 13-pdr was regarded as being in a class of its own in terms of mobility and power; but once the gun entered service shortcomings were exposed, chiefly caused

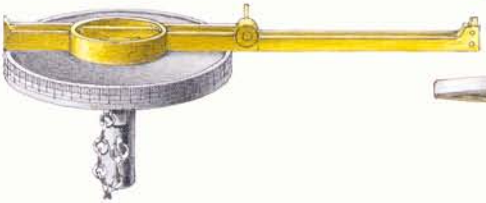


RHA QF 13-pdr coming into action 'at practice', Inexent, June 1917. The gun has been unlimbered and turned to face the enemy; the ammunition wagon is arriving alongside. Note the 'parade ground' turnout of gun, horses and crew. (IWM Q6719)

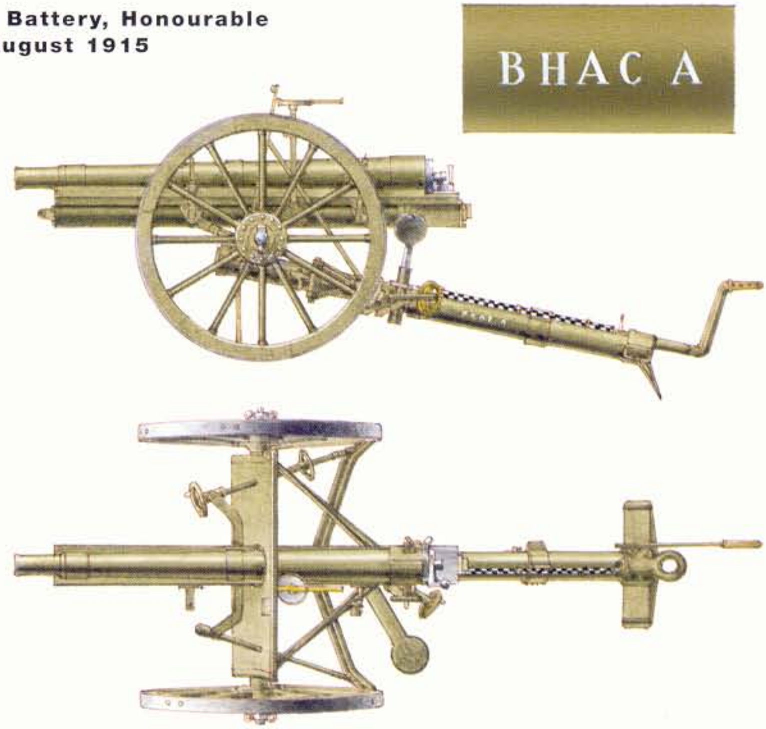
A1: BLC 15-pdr field gun, 1st Wessex Brigade TF, UK, August 1914

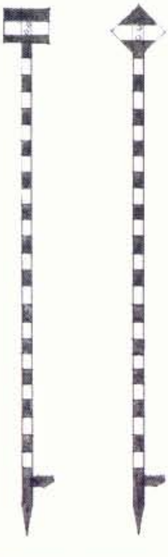


A2: Dial Sight No. 1



A3: QF 15-pdr field gun, B Battery, Honourable Artillery Company, Aden, August 1915

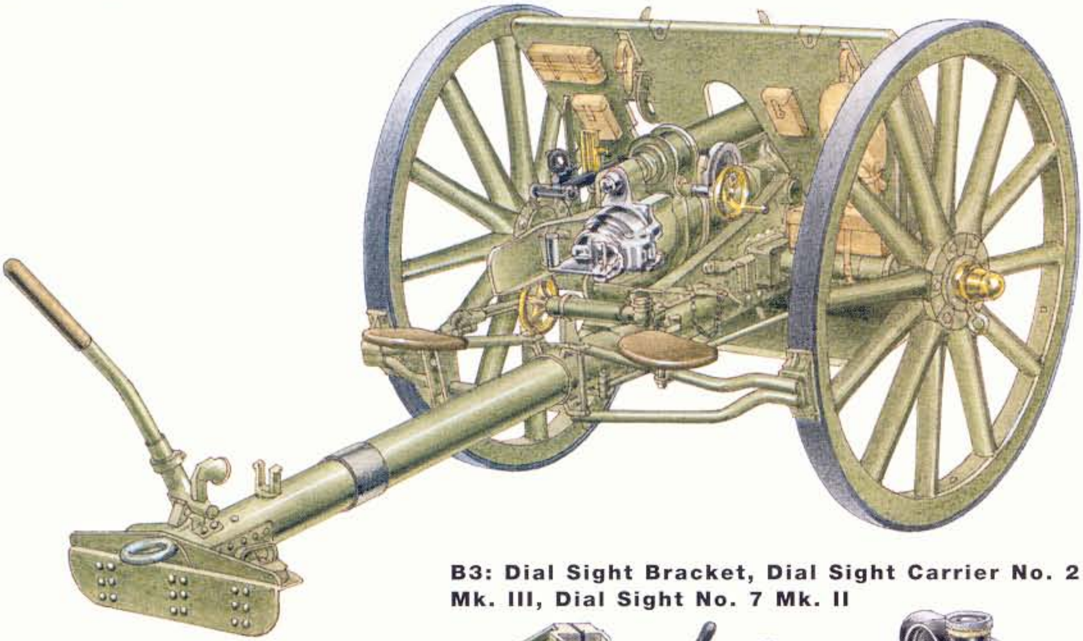




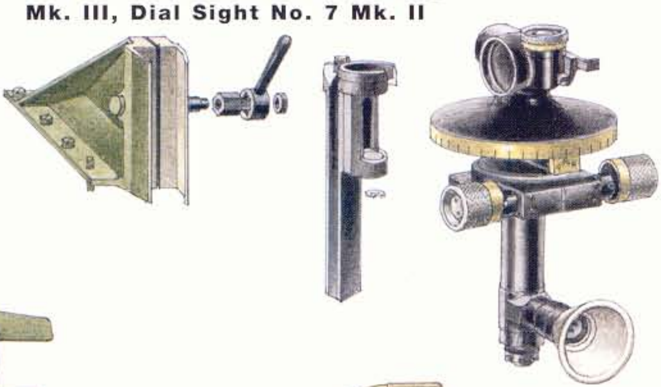
A4: Aiming posts

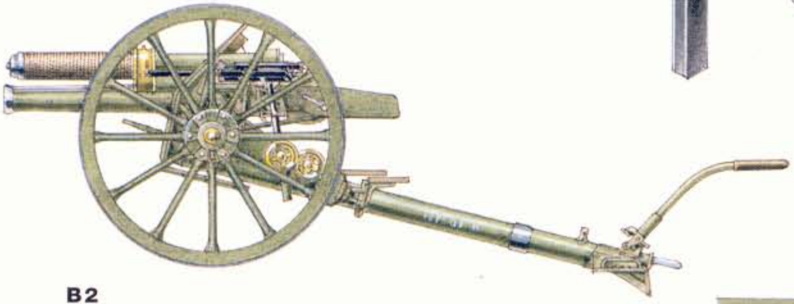
A

B1 and B2: QF 13-pdr gun, D Battery, RHA, Inexent, 20 June 1918

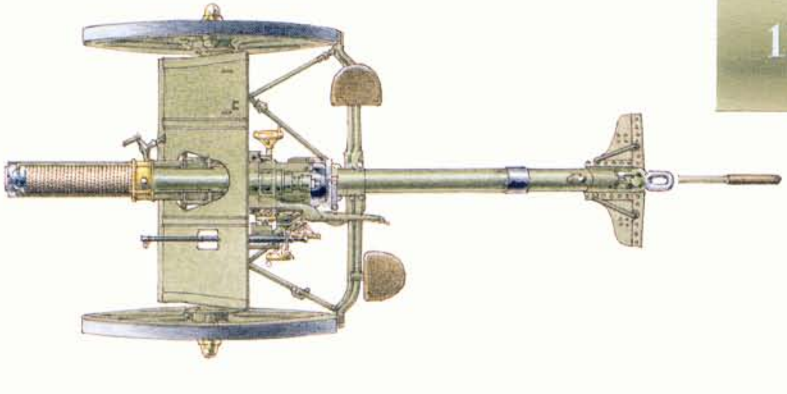


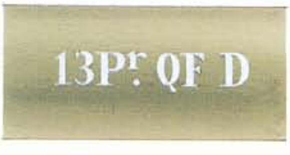
B3: Dial Sight Bracket, Dial Sight Carrier No. 2 Mk. III, Dial Sight No. 7 Mk. II



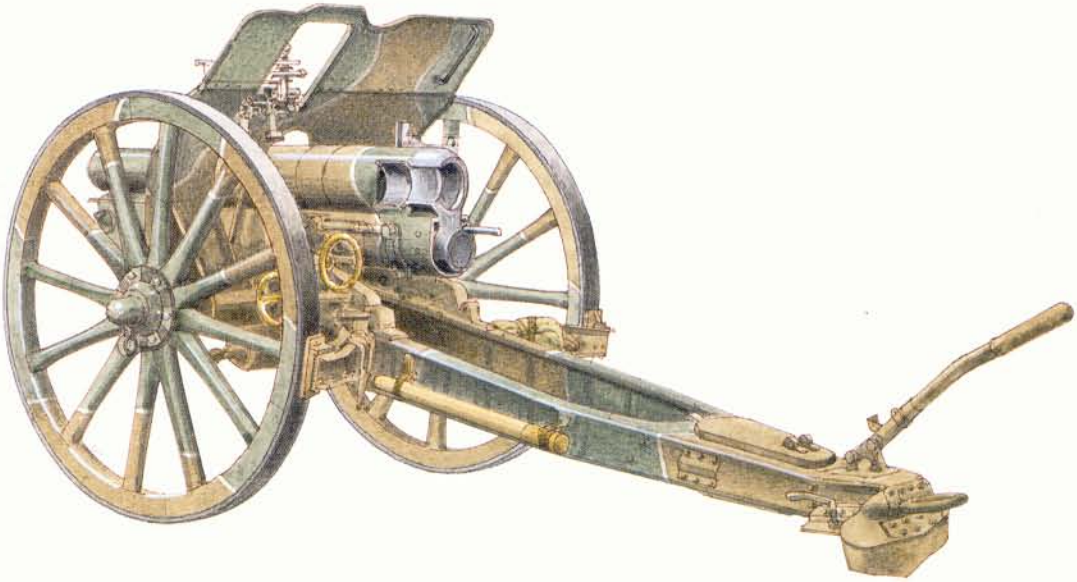


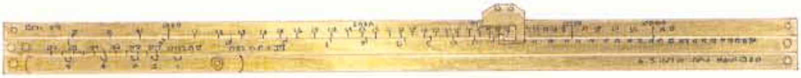
B2



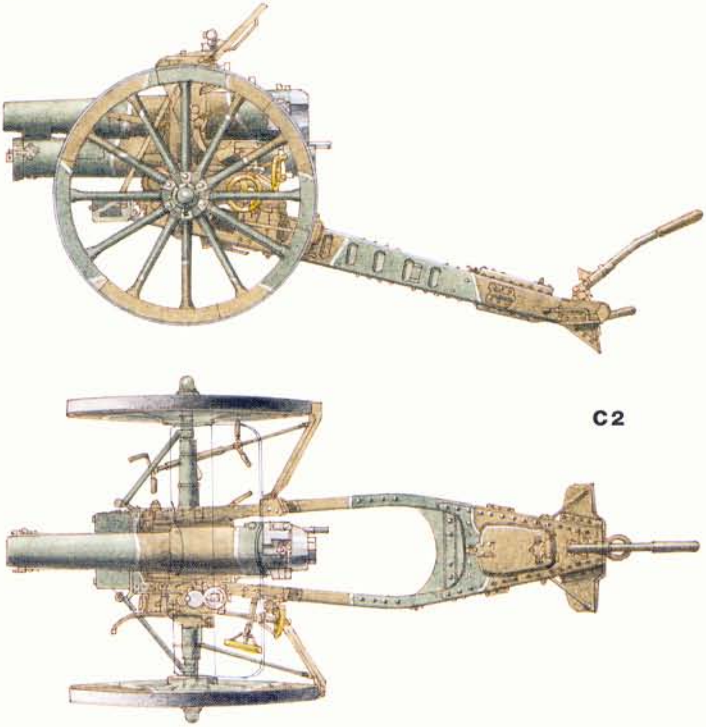


C1 and 2: QF 4.5-in. howitzer, 104th Brigade, 22nd Divisional Artillery, France, 1917

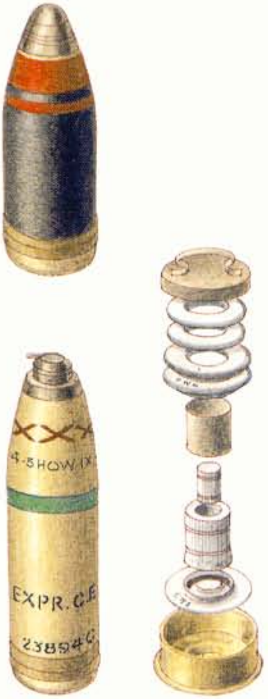




C3: Fuse indicator



C2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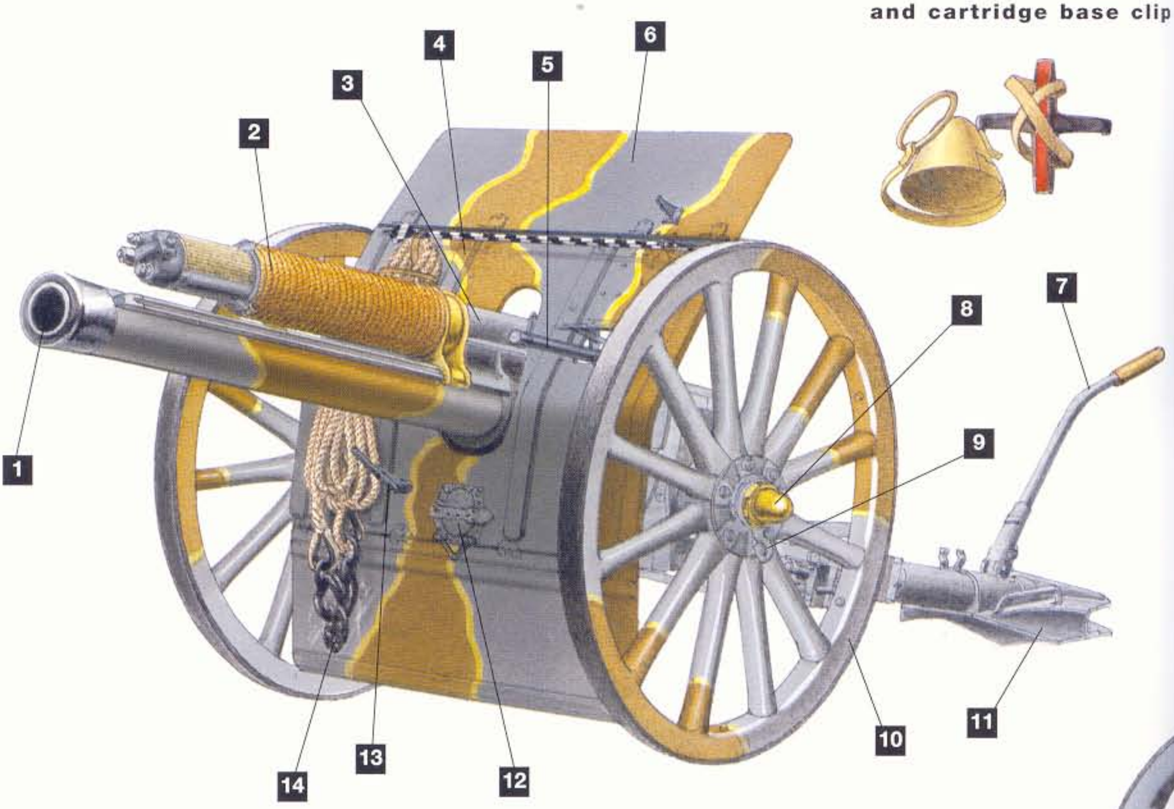
C4: Howitzer ammunition

D1: QF 18-PDR FIELD GUN, 63RD (ROYAL NAVAL) DIVISION, 1918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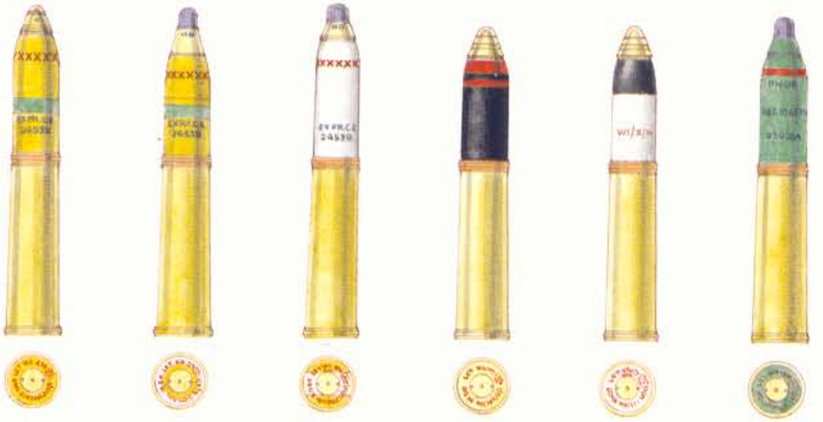
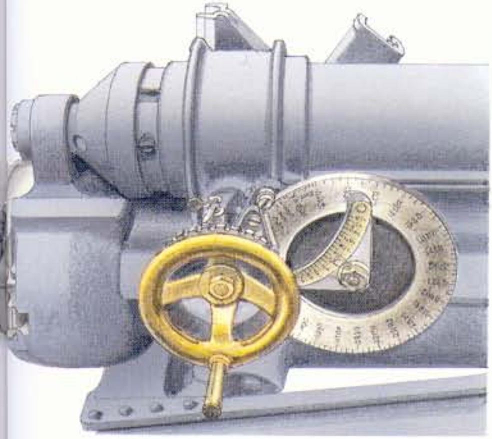
D2: 18-pdr fuse cap and cartridge base clip



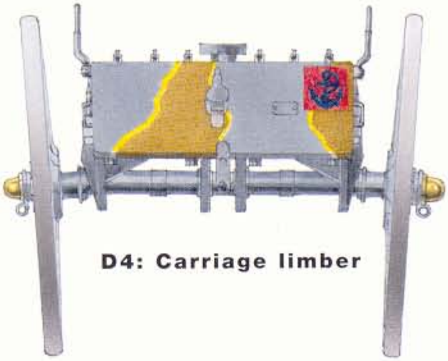
D5: 18-pdr ammunition

KEY

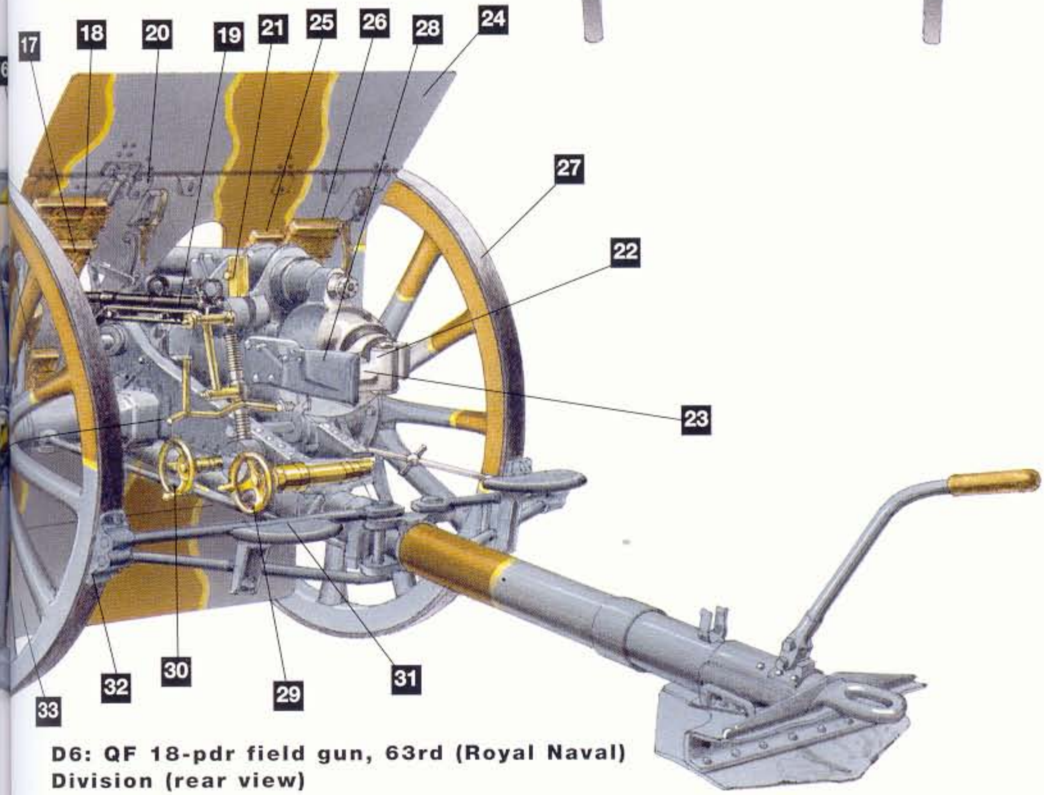
1 Muzzle
2 Recuperator
3 Cradle
4 Ash slat
5 Rocking bar sight
6 Boynton steel shield
7 Traversing lever
8 Hub cap
9 Drag washer
10 2nd Class C No. 45 Mk. III Wheel
11 Spade
12 Door (for cleaning kit) and advance loop
13 Brake handle
14 Drag ropes
15 Firing handle
16 Telescope sight case
17 Sight clinometer case
18 Field clinometer case
19 Telescopic sight bracket
20 Fuse indicator mounting
21 Dial sight bracket
22 Breech block
23 Lever, breach mechanism (obscured)
24 Upper folding shield
25 Lubricating can case
26 Dial sight case
27 Iron tyre
28 Layer's recoil shield
29 Traversing wheel
30 Elevating wheel
31 No. 3's (layer's) seat
32 Iron brake shoe
33 Lower folding shield



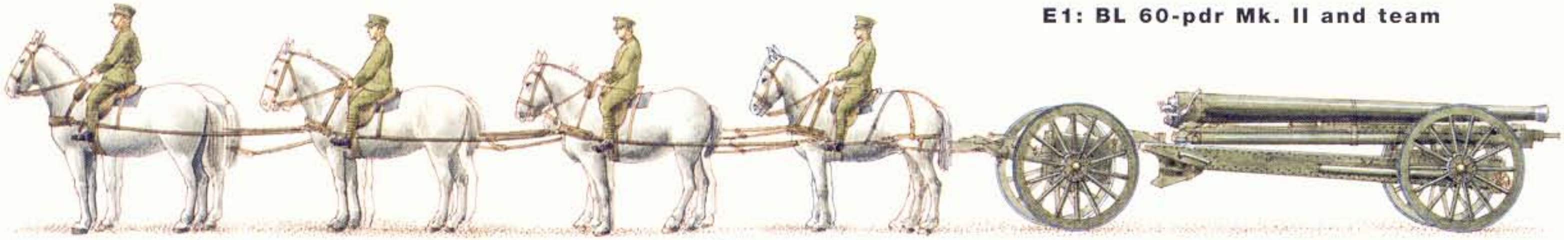
D3: Range indicator, QF 18-pdr field gun



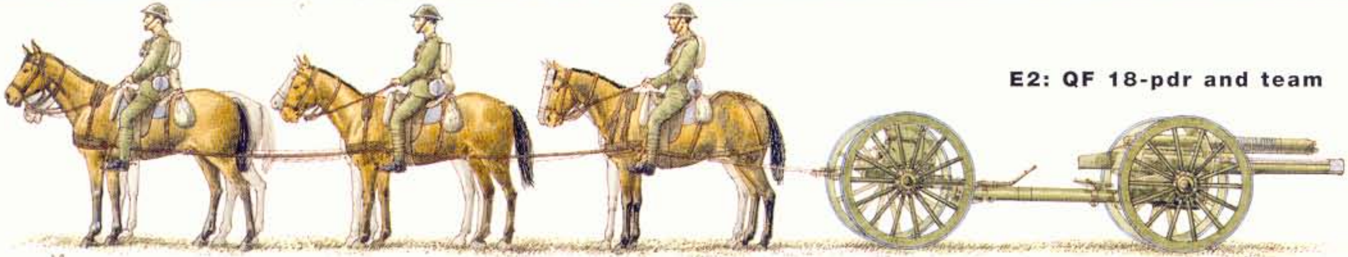
D4: Carriage limber



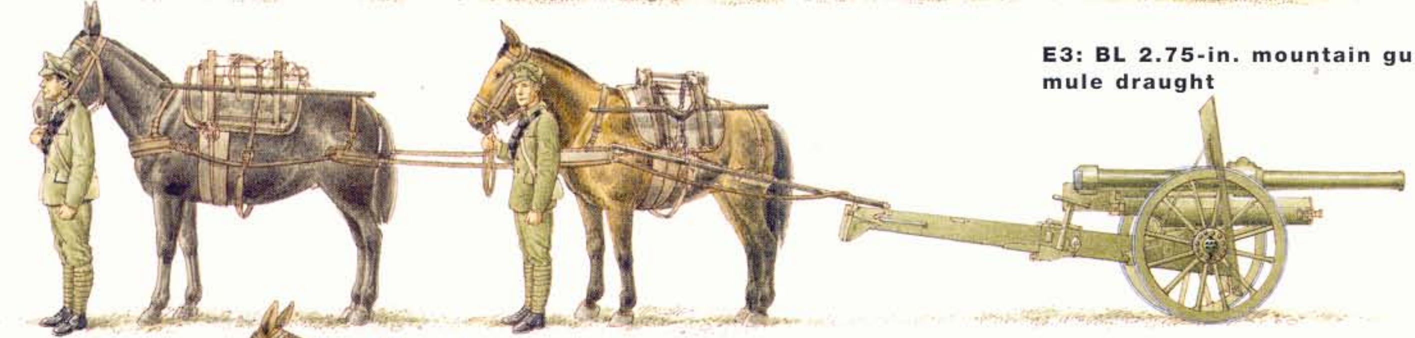
D6: QF 18-pdr field gun, 63rd (Royal Naval) Division (rear view)



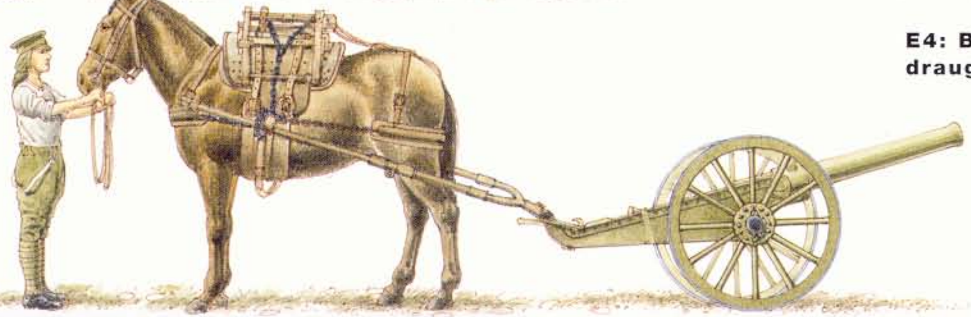
E1: BL 60-pdr Mk. II and team



E2: QF 18-pdr and team

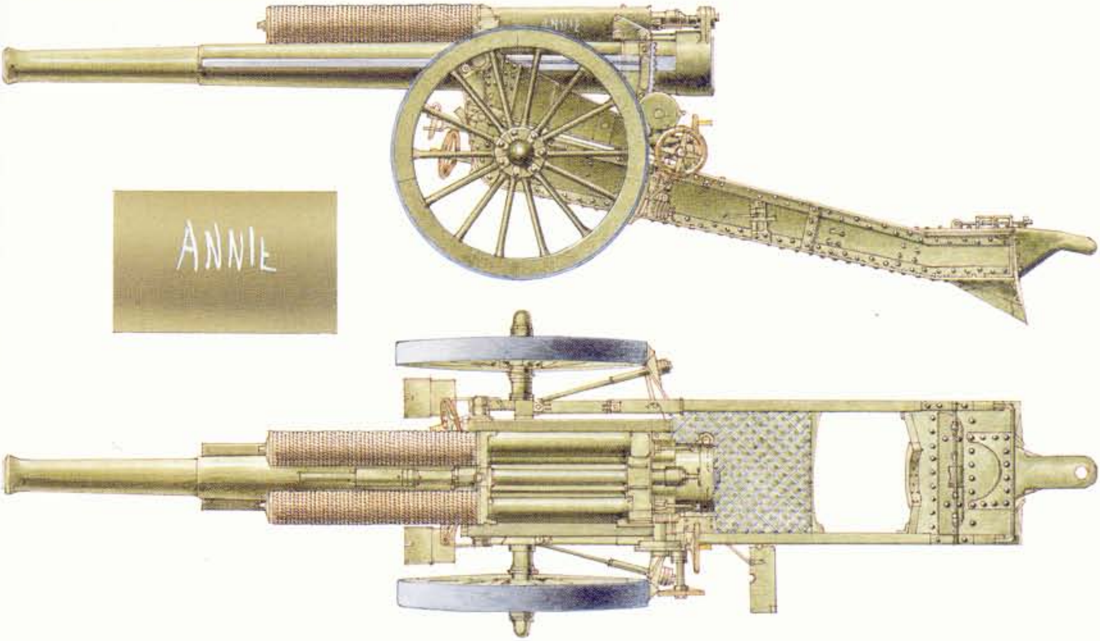


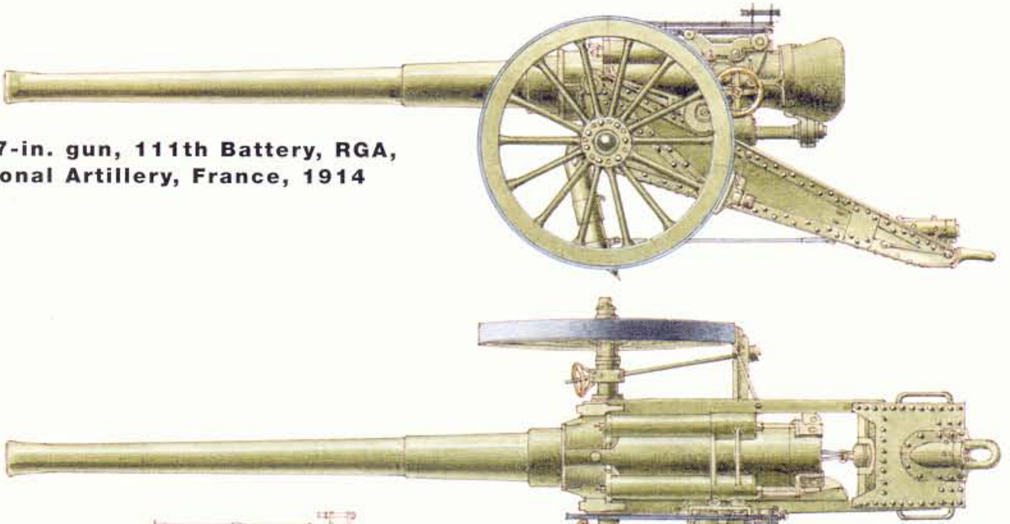
E3: BL 2.75-in. mountain gun, mule draught



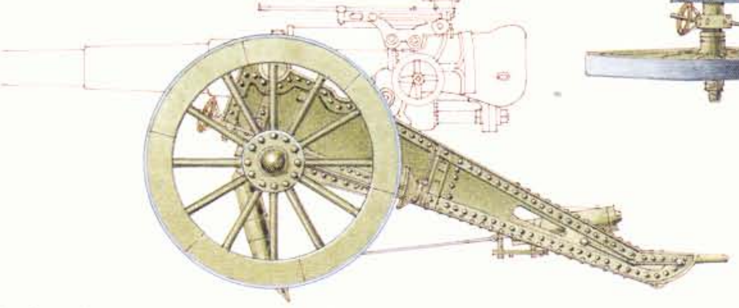
E4: BL 10-pdr mountain gun, mule draught

F1: BL 60-pdr gun Mk. I, 29th Divisional Artillery, Cape Helles, Gallipoli, 1915

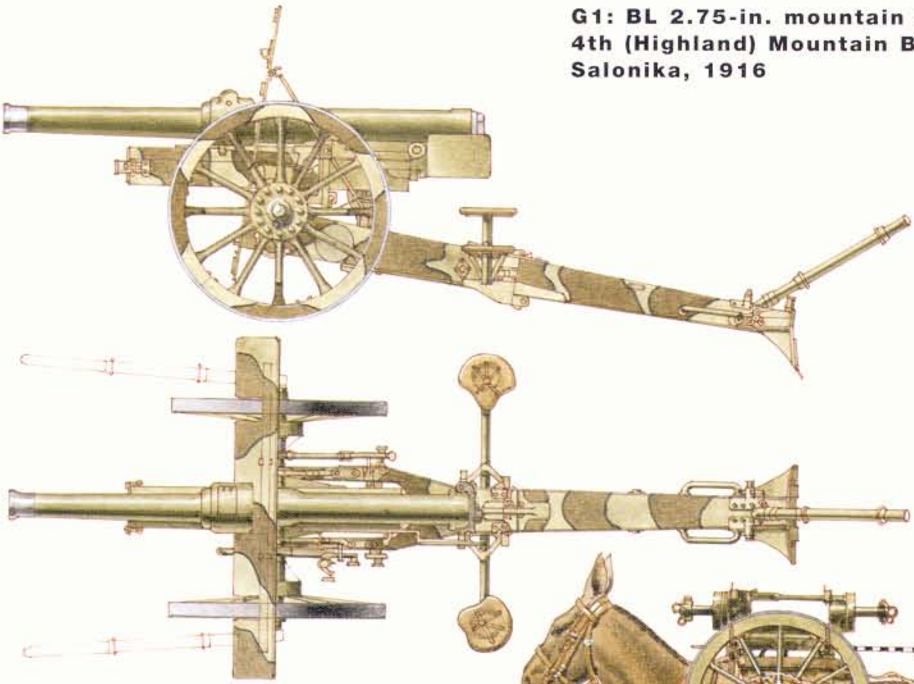




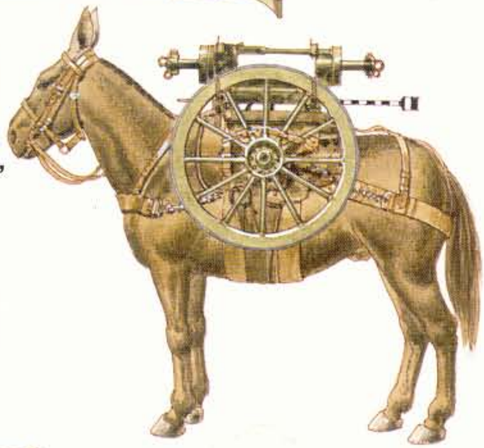
F2: QF 4.7-in. gun, 111th Battery, RGA, 7th Divisional Artillery, France, 1914



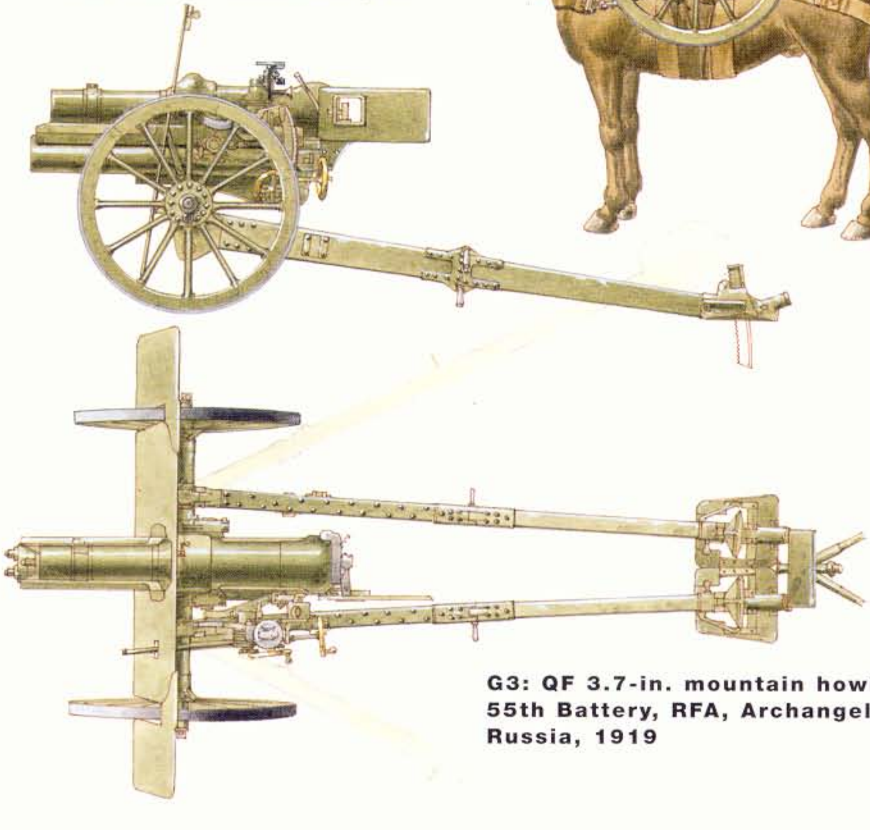
F3: Carriage, travelling, QF 4.7-in., converted



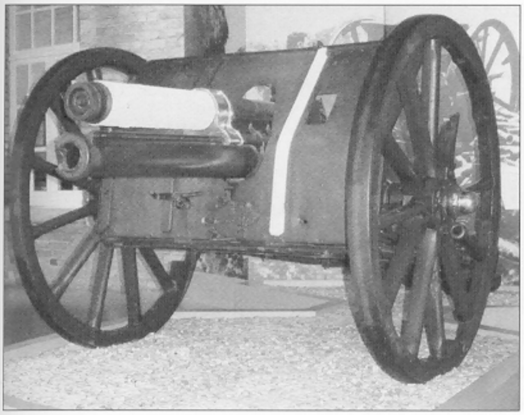
G1: BL 2.75-in. mountain gun, 4th (Highland) Mountain Brigade, Salonika, 1916



G2: 'Wheels and axle mule', BL 2.75-in. mountain gun



G3: QF 3.7-in. mountain howitzer, 55th Battery, RFA, Archangel, Russia, 1919



Néry Gun. Surprised at bivouac, at dawn on 1 September 1914, officers and men of L Battery, RHA, managed to bring three QF 13-pdr guns into action, despite intense artillery and small arms fire. C and D guns were almost immediately put out of action, but F held off the enemy for two hours, engaging German guns at a range of 720 yards, until the situation could be restored by British cavalry, supported by I Battery, RHA. The German division was driven off, losing eight of its twelve 77mm guns. Three members of L Battery were awarded the Victoria Cross. This shell-scarred gun from the battery is displayed at the Imperial War Museum, Lambeth. (Author's photograph, reproduced courtesy of IWM)

by the drive to reduce weight. Modifications were required to strengthen the equipment for service use. There were also imperfections in the design, which emerged in service. The light, strong, pole trail gave the carriage a tight turning circle, but limited elevation to an arc of only 16 degrees, condemning the gun to a disappointingly short maximum range. There was also the problem of 'side-slip', the result of the barrel recoiling across the line of the carriage when firing traversed, a problem made worse by 'unsteadiness' when firing, due to the type of recuperator used. It was necessary to re-lay the gun frequently and by 1913–14 it was even being suggested that the once-mighty 13-pdr might not deserve the description 'QF'. In the event it was none of these issues, but weight of shell, which led to the 13-pdr being marginalised in favour of the 18-pdr. 13-pdrs performed well in the mobile battles of 1914–15 on the Western Front, and in Africa and the Middle East, but in the trenches the gun's shell was ineffective and some RHA batteries were re-equipped with the 18-pdr.

In the UK, 245 QF 13-pdr field guns were built before World War I, and 21 in India. A further 50 were manufactured in the UK, and 100 in the USA during the war. 114 were in service at the end of the war. Mk. II guns differed from Mk. I in having the 'A' tube (inner barrel) slightly tapered, so that in manufacture the gun could be built up hydraulically – rather than by the shrinking process.

From 1914 converted Mk. I and II 13-pdrs provided the earliest effective British anti-aircraft gun – the 13-pdr gun Mk. III on mounting Anti-Aircraft Mk. I (see the companion volume in this series). The guns were modified by fitting a retaining catch to the underside of the breech ring, to hold the cartridge in place when loading at high angles. When Mk. III guns returned to use as field guns after World War I, the cartridge retaining catch was removed and the hole plugged. A modified 13-pdr was also produced for sea service.

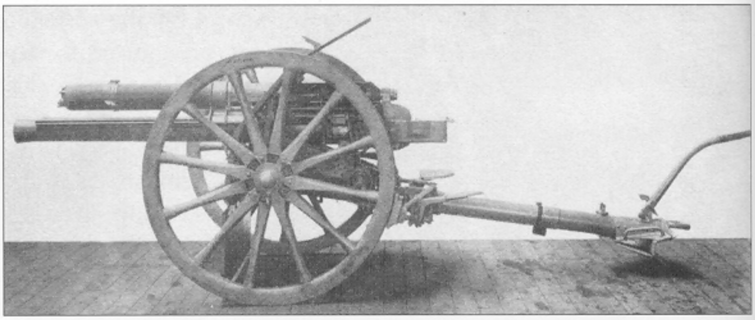
5,470,000 rounds of 13-pdr ammunition were produced during the war, of which 1,500,000 were expended on the Western Front. During the 1930s the gun was replaced by the 3.7-in. Pack Howitzer and QF 18-pdr Mk. IV in RHA service. QF 13-pdr guns remain in service with King's Troop, RHA, for ceremonial duties and to fire salutes on state occasions.

SPECIFICATION

Nomenclature:	Ordnance QF 13-pdr gun Mk. I or II on carriage field 13-pdr Mk. I
Weight of equipment:	19cwt 3qr 24lb
Ammunition type:	fixed QF
Calibre:	3-in.
Projectile type and weight:	shrapnel, 12lb 8oz; later HE
Maximum range:	5,900 yards

QF 18-pdr Mk. I and II field gun

The most important British field piece of World War I, the QF 18-pdr was adopted as the British Army's field gun on Christmas Eve 1904. Although an improved 18-pdr field gun entered service in 1918, the original gun remained in service into World War II. It was exported, and a version manufactured for the US Army. The Mk. I and II guns differ only in the method of construction of the barrel. A modified Mk. II carriage entered service from 1916.

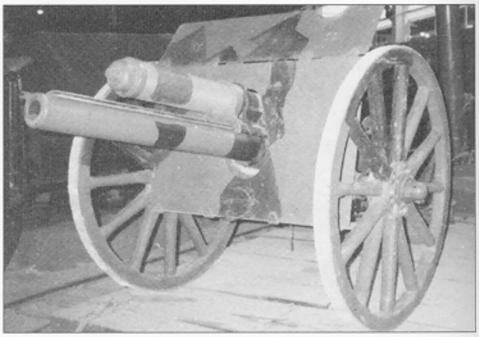


QF 18-pdr field gun Mk. II on carriage Mk. II. The 'air recuperator' of the Mk. II carriage is indicated by the torpedo-shaped gunmetal (bronze) reservoir bolted to the front of the recuperator spring case. (Reproduced courtesy of RAHT)

The specifications issued by the Equipment Committee of 1901 and the trials of 1903 resulted in a composite field gun design, which was to be built in two versions: a 13-pdr for the horse artillery and an 18-pdr for the field artillery. Initially the 13-pdr emerged as a more successful gun, and the 18-pdr was almost cancelled. Fortunately, Prime Minister Balfour opted for the original plan and, from 1906, the QF 18-pdr entered service with the RFA, the new equipment (wagons, limbers, and accessories as well as guns) being issued a division at a time to avoid over-complicating logistics. The most obvious difference between the 13-pdr and 18-pdr was barrel length – the barrel of the 18-pdr protruding well beyond the recuperator/buffer case. In fact, the 18-pdr barrel was longer both to the front and rear, wider than that of the 13-pdr, and the recuperator assembly larger – all of which affected the dimensions of the carriage. Nevertheless, once the axletree seats of the 18-pdr had been replaced with a shield, the gun was functionally identical to the 13-pdr.

As for the 13-pdr, modifications were required to strengthen the 18-pdr for service use. Because of the pole trail, the gun shared the 13-pdr's limited range, and the recuperator springs proved prone to failure, even under peacetime conditions. Nothing could be done about the carriage without a complete re-design, but the recuperator could be improved by fitting a hydro-pneumatic system – much smoother in action, and less likely to break (compressed air being used in place of steel springs). However, it was expensive, and there was no guarantee that it would function effectively across the wide range of climates experienced by British troops. Nonetheless, design for a hydro-pneumatic conversion for the 18-pdr was trialled during 1913–14. Another source of criticism was the interrupted-screw breechblock – a sliding wedge like that of the 4.5-in. howitzer would be quicker to use. With the breechblock, recuperator and trail of the 18-pdr under scrutiny, it was quite apparent that new equipment was called for. The 'conditions' for a new field gun were published in October 1913, but the British Army went to war before re-armament could commence.

During the war the 18-pdr proved an effective and popular equipment. With an actual weight of 18.5 pounds (8.4kg), the 18-pdr shell was significantly heavier than its contemporaries, the French 75mm (6.2kg) and German 77mm (6.85kg), and a variety of ammunition was developed following the success of an experimental HE shell in the battles of 1914. The gun's most serious defect was the weakness of the recuperator springs. On the recoil stroke the barrel was slowed by the springs and the oil in the buffer, and as the springs returned the gun to battery the final movement was also cushioned by oil. For the system to work



75mm M1917 (British). The US version of the 18-pdr had a shorter barrel, with no swell at the muzzle, and a flat shield. The lower shield segment is not deployed in this example. (Author's photograph, reproduced courtesy of IWM Duxford) correctly the buffer had to contain just the right amount of oil – which was rapidly lost during intense firing. In the short term, a rectangular gunmetal (bronze) reservoir, protected by a three-sided rectangular shield, was fitted to the front of the spring case to keep the buffer oil topped up. Subsequently, hydro-pneumatic recuperators were fitted into the original spring case, a torpedo-shaped bronze reservoir being bolted to the front, lengthening it by about a foot. The resulting carriage was the Mk. II (or Mk. I* if converted from an existing carriage).

Prior to World War I, 1,126 18-pdrs were manufactured in the UK and 99 in India, 280 being supplied to Canada, South Africa, Australia and New Zealand. A further 8,393 18-pdrs were manufactured in the UK during the war, and another 851 in the USA. American production of equipments for the UK was completed by 1917, when the gun was redesigned to accept the French 75mm shell (the US Army having adopted French artillery equipment and ammunition) and placed in production for the US Army as the Gun, 75mm, M1917 (British). In 1941 the US reserve stock of M1917 field guns was supplied to Britain for home defence.

For ballistic reasons, the 18-pdr was less successful than the 13-pdr as an anti-aircraft gun. However, by re-lining it to accept a 13-pdr shell fired from a necked-down 18-pdr case, an effective anti-aircraft gun, the 13-pdr 9cwt Mk. I, was produced, entering service in 1916 and remaining in use into the 1920s.

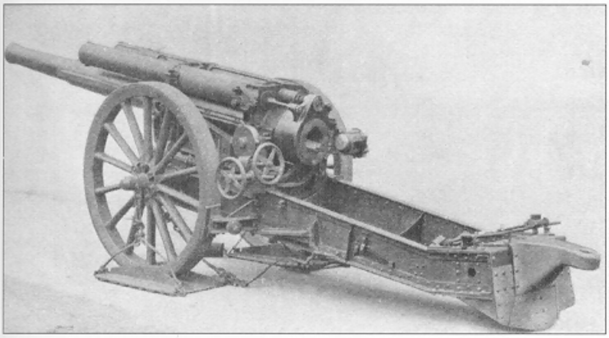
Some 113,000,000 rounds of 18-pdr ammunition were issued during World War I; 99,300,000 rounds were expended on the Western Front.

SPECIFICATION	
Nomenclature:	Ordnance QF 18-pdr gun Mk. I or II on carriage field QF 18-pdr gun Mk. I or II
Weight of equipment:	1 ton 5cwt 0qr 21lb
Ammunition type:	fixed QF
Calibre:	3.3-in.
Projectile type and weight:	shrapnel, 18.5lb; HE; smoke; incendiary; gas
Maximum range:	6,525 yards

BL 60-pdr Mk. I field gun

The BL 60-pdr entered service in 1905, replacing the QF 4.7-in. gun in Regular heavy field batteries. During World War I the gun also replaced the 4.7s of the TF batteries. The Mk. I gun was superseded by the Mk. II during the inter-war period.

BL 60-pdr Mk. I. Despite the large recuperators, drag shoes were still required to limit recoil. (Reproduced courtesy of RAHT)



After the Boer War, heavy batteries had been added to the field army, using the QF 4.7-in. gun as an expedient. In 1902 a Heavy Battery Committee was appointed to develop the specification of a future heavy field gun. The QF 4.7-in. (firing a 46-pound shell) and a 30-pdr in service with the Indian Army were dismissed in favour of an Armstrong-designed gun firing a powerful 60-pound shrapnel or HE shell. Designing a suitable carriage caused difficulties, but trials commenced in 1904 and the BL 60-pdr Mk. I was approved for service in 1905. At roughly 4½ tons, it was at the upper limits of what could be considered field artillery with horses as the means of traction. The new gun was also tested with mechanical traction and could either be attached to a limber or fitted with an 'engine draught connector'. To distribute the weight of the gun evenly between carriage and limber, the barrel and cradle could be slid to the rear. The 60-pdr carriage lacked the shield of the lighter guns – although the recuperator spring casings were bullet proof, to prevent the gun being put out of action by enemy shrapnel.

Between 1909 and 1914, 41 60-pdr Mk. Is were built, of which 24 were supplied to Canada and India. On the outbreak of war, a new Mk. II carriage was designed which was quicker and easier to produce, but this added a ton to the equipment's weight, abandoned the sliding barrel and cradle, and placed the 60-pdr beyond animal traction. However, it was found that if the barrel could be disconnected from the recuperator and slid back to its 'recoiled' position when moving, lighter wheels and axles could be used. This resulted in the carriage Mk. III (or Mk. II* if converted). Two manufacturing variations, the BL 60-pdr Mk. I* and Mk. I** were approved in 1915.

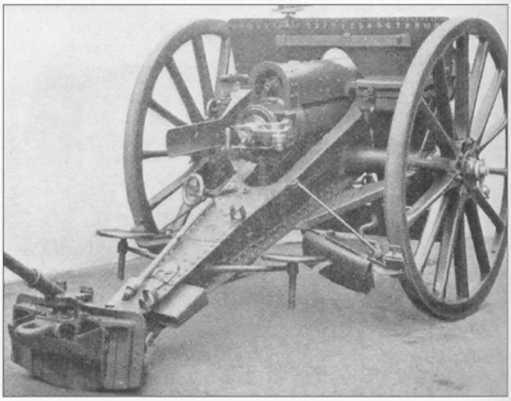
1,756 60-pdrs were produced, of which 571 remained in service on various fronts in 1918. 52 were supplied to Russia in 1917. During the war, an alteration to the shape of the shell extended the gun's range from 10,300 yards to 12,300 yards. 10,125,321 60-pdr rounds were expended on the Western Front.

SPECIFICATION

Nomenclature:	Ordnance BL 60-pdr gun Mk. I, I* or I** on carriage field BL 60-pdr Mks. I, II, II* or III
Weight of equipment:	Mk. I carriage 4 ton 8cwt; Mk. III carriage 5 ton 1qr
Ammunition type:	separate loading BL
Calibre:	5-in.
Projectile type and weight:	shrapnel, HE, 60lb; smoke; gas
Maximum range:	10,300 yards; 8 calibre radius head 12,300 yards

BLC 15-pdr field gun

The BLC 15-pdr served as the field gun of the TF and New Army field batteries on the Western Front during the early part of World War I, until replaced by the QF 18-pdr and withdrawn for use in training; some remained in service on the Western Front as anti-tank guns and on other fronts as field guns until 1918.

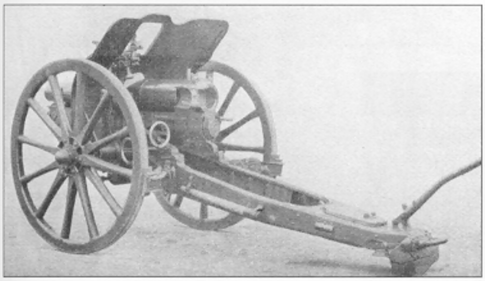


BLC 15-pdr. The inverted U-shaped steel cradle containing the recuperator is obvious above the breechblock, as is the large trail spade, intended to provide the gun with a form of 'carriage traverse'. The shield has a degree scale painted on the upper edge to assist laying, and a No. 1 Dial Sight is mounted above the slide-rule-like fuze indicator. Compare with the BL 15-pdr illustrated on page 17. (Reproduced courtesy of RAHT)

Lord Haldane knew that parliamentary support for his 1908 reorganisation of the Volunteers would not extend to the expense of supplying QF 18-pdr guns to the TF field batteries. The solution was to rebuild surplus BL 15-pdrs as extemporised QF guns, thus enabling TF field batteries to practice with something approximating to a QF field gun, until the opportunity could be found to provide them with the real thing. To convert the BL 15-pdr, the gun was dismounted from the carriage and the trunnions removed. A forged steel cradle, shaped like an inverted 'U' with a set of trunnions on the lower edges, was mounted on the carriage. A recuperator, similar to that used on the QF 13-pdr, was fitted inside the cradle, and the barrel hung beneath it. The axletree seats were removed and replaced by a shield. To achieve some 'carriage traverse', the foot of the trail was lengthened and fitted with a spade. By pushing the traversing lever the gun carriage could be made to traverse up to two degrees to the right or left, sliding in the spade frame. The resulting equipment became the BLC (for 'Converted') 15-pdr. It fired the same 14-pound shrapnel shell as the QF 15-pdr. The Territorial Force were issued wth 536 BLC 15-pdr guns – sufficient to equip 134 four-gun field batteries. 50 were supplied to Italy during World War I.

SPECIFICATION

Nomenclature:	Ordnance BL converted 15-pdr gun Mk. I, II or IV on carriage field BLC 15-pdr Mk. I
Weight of equipment:	26cwt 1qr 13lb
Ammunition type:	separate loading BL
Calibre:	3-in.
Projectile type and weight:	shrapnel, 14lb; canister
Maximum range:	5,750 yards



QF 4.5-in. howitzer. (Reproduced courtesy of RAHT)

QF 4.5-in. field howitzer

The QF 4.5-in. replaced the BL 5-in. howitzer, and served as the British Army's field howitzer from 1908 to 1944.

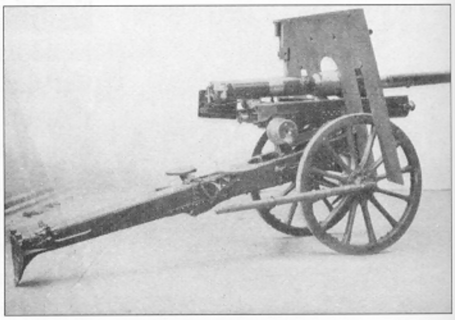
The development of a new field howitzer to replace the 5-in. was approached in the same manner as for the field guns. However, it proved much more difficult to find a true QF field howitzer – and more difficult still to find one that out-performed the 12cm Krupp howitzers captured in South Africa. Troop trials only commenced in 1905 and the chosen design – from the Coventry Ordnance Works – was not ready to enter service until 1908. The new QF howitzer displayed several novel features, including a sliding breechblock (for the first time in a British field piece), a box trail, and variable recoil to permit operation at high elevation (the recoil diminished from 40 inches when horizontal – when the gun was most inclined to run back – to 20 inches at 45 degrees – when the breech was most likely to strike the ground). A Mk. II howitzer, with a redesigned and strengthened breech entered service in 1917.

Prior to World War I, 182 QF 4.5-in. howitzers were built in the UK, 45 being supplied to Canada, New Zealand and India. A further 3,177 were manufactured during World War I. 1,225 were in service in 1918. 400 were supplied to Russia. In total, 29,200,000 rounds of ammunition were produced, of which 25,000,000 were fired on the Western Front. The gun also saw action in the early battles of World War II. It was replaced by a 'gun-howitzer', the QF 25-pdr Mk. II.

SPECIFICATION

Nomenclature:	Ordnance QF 4.5-in. howitzer Mk. I or II on carriage field QF 4.5-in. howitzer Mk. I
Weight of equipment:	1 ton 6cwt 3qr 14lb
Ammunition type:	separate loading QF
Calibre:	4.5-in.
Projectile type and weight:	HE, 35lb; shrapnel; smoke; star shell; incendiary; gas
Maximum range:	7,300 yards

BL 2.75-in. mountain gun



BL 2.75-in. mountain gun. Handspikes have been fitted to the wheels to rotate the axle into the high position (shown). (Reproduced courtesy of RAHT)

Adopted in 1911, the BL 2.75-in. mountain gun only entered service in 1914. Some were sent to France in November 1914 with an Indian mountain brigade, but were unsuitable for that theatre and were sent on to Egypt. The gun saw extensive service on the Salonika front. It was replaced after World War I by the QF 3.7-in. pack howitzer.

The BL 10-pdr mountain gun of 1901 was little more than a breech-loading version of Kipling's 'Screw Gun'. In order to give mountain batteries an equipment with characteristics closer to contemporary QF field guns, the gun was further modernised by removing the trunnions from the barrel, discarding the old carriage and substituting an elaborate new one with a pole trail, recuperator, shield, seats, and a cranked axle to enable the height of the equipment to be varied. The weight of the shell was increased to 12½ pounds, with a range of 5,600 yards. The new gun could be carried as six mule loads or fitted for draught.

183 2.75-in. mountain guns were built during World War I and 106 were in service in 1918. In total, 289,900 rounds of ammunition were produced.

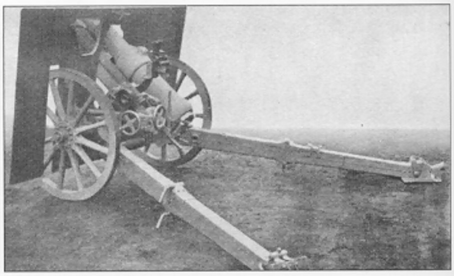
SPECIFICATION	
Nomenclature:	Ordnance BL 2.75-in. gun Mk. I on carriage mountain BL 2.75-in. Mk. I
Weight of equipment:	11cwt 2qr 3lb
Ammunition type:	separate loading BL
Calibre:	2.75-in.
Projectile type and weight::	shrapnel, 12.5lb; HE
Maximum range:	shrapnel 5,600 yards, HE 5,800 yards

QF 3.7-in. mountain or pack howitzer

The 3.7-in. howitzer entered service in 1915, and saw some use in the Eastern theatres during World War I. It was used extensively inter-war and during World War II, and finally declared obsolete in 1960.

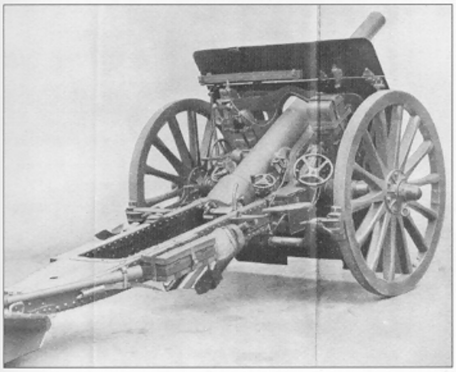
The Indian Army, with wide experience of mountain warfare, wanted a mountain howitzer to accompany the 2.75-in. mountain gun. 'Conditions' were issued in 1912 and in 1914 trials commenced that would eventually result in the excellent QF 3.7-in. pack howitzer. The howitzer entered service in 1915 and 70 were built during World War I, of which 22 were in action in 1918. It was the first British artillery piece to use a split trail, giving it good elevation and a traverse of 20 degrees left or right. The last 'screw gun', with separate breech and chase sections, the 3.7-in. could be carried as eight mule loads. The howitzer was fitted with a hydro-pneumatic, variable-recoil buffer/recuperator and a large shield. After 1918 it served with the Light Batteries of the Experimental Armoured Force as a close support gun. It replaced the BL 2.75-in. mountain gun, and from 1934 superseded the QF 13-pdr of the RHA, towed behind 'Light Dragon' tracked vehicles on the strengthened, pneumatic-tyred carriage Mk. IV (the carriage Mk. II had fittings for draught, and the Mk. III had fixed, rather than removable, spades). It also replaced the 12-pdr 8cwt as the Royal Navy's Landing Gun.

QF 3.7-in. mountain howitzer with its heavy and unpopular shield. (Reproduced courtesy of RAHT)



SPECIFICATION	
Nomenclature:	Ordnance QF 3.7-in. mountain howitzer Mk. I on carriage QF mountain howitzer Mk. I (later II, III or IV)
Weight of equipment:	1,610lb
Ammunition type:	separate loading QF
Calibre:	3.7-in.
Projectile type and weight:	HE, 20lb; shrapnel; smoke
Maximum range:	5,899 yards

QF 18-pdr Mk. IV field gun



The QF 18-pdr Mk. IV field gun, on Carriage Mk. III, shared many of the features of the 4.5-in. howitzer, anticipating the 25-pdr gun-howitzer of World War II. (Author's collection)

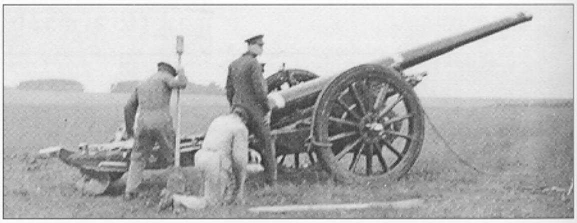
The QF 18-pdr Mk. IV was a field gun of improved design, which entered service in the final months of World War I, formed the basis of the first 25-pdr guns of the late 1930s, and was finally replaced by the QF 25-pdr Mk. II during World War II.

Whilst the importance of the QF 18-pdr Mk. I and II cannot be overstated, weaknesses in the design had been identified even before the start of World War I. The solution to the elevation problem was to adopt a new carriage, using either a box trail, like that of the 4.5-in. howitzer (but these tended to be bulky and heavy, and their width reduced turning lock when the gun was hooked up to its limber), or a split trail, as used for the 3.7-in. howitzer. In the event both types would be adopted for the 18-pdr Mk. IV, as the Carriages Mk. III, IV (box) and V (split). Only the Mk. III (early-pattern box trail) saw service during World War I. Apart from the trail, the distinctive cylindrical spring case was abandoned, in favour of a howitzer-style, variable-recoil, hydro-pneumatic system in a rectangular casing beneath the barrel, and the breechblock was replaced by a single-motion 'Asbury' breech. With 30 degrees of elevation the range of the 18-pdr was increased by over 2,600 yards. Furthermore, the new carriage steadied the gun and was easier to maintain, all without significantly increasing the weight of the equipment.

A single battery of Mk. IVs served with the Fourth Army during the last two months of World War I. Post-war, some QF 18-pdr Mk. IVs were adapted for use on a tracked chassis, the Mounting self-propelled QF 18-pdr Mk. I (also known as the Birch Gun), which entered service in 1925 and continued in various experimental roles until July 1931. From 1936, 1,000 18-pdr Mk. IVs were converted into 25-pdrs by inserting a new barrel liner of 3.45-in. calibre. The resulting equipment was officially termed Ordnance 25-pdr Mk. I, but was usually known as the '18/25-pdr' (See New Vanguard 48: *The 25-pounder Field Gun 1939–72*). The 18-pdr Mk. IV saw widespread service during the early part of World War II and was retained as a training weapon until 1944.

SPECIFICATION	
Nomenclature:	Ordnance QF 18-pdr gun Mk. IV on carriage field 18-pdr Mk. III
Weight of equipment:	1 ton 7cwt 3qr 8lb
Ammunition type:	fixed QF
Calibre:	3.3-in.
Projectile type and weight:	shrapnel, 18.5lb; HE; smoke
Maximum range:	9,300 yards

BL 60-pdr Mk. II field gun



60-pdr Mk. II. The gun's clean lines are shown to advantage by the inter-war 'deep bronze green' high-gloss finish. Note the drag rope looped over the wheel to assist in traversing the carriage. (Reproduced courtesy of RAHT)

The BL 60-pdr Mk. II was a modernised 'heavy field', or medium gun, the first production batch of four being ready for service, but not shipped to the front, when World War I ended. The Mk. II entered service following World War I and remained with the British Army until 1944.

In many respects the 60-pdr Mk. II was closer to the design of the 18-pdr Mk. IV than previous 60-pdr designs. The gun was fitted with a single-motion 'Asbury' breech, while the carriage featured a hydro-pneumatic recoil system (which could be disconnected to run the gun back for transportation) and a revised box trail, which gave 35 degrees of elevation. It was strong, steady, and simpler to maintain than previous marks. The BL 60-pdr Mk. II saw its final action in the Western Desert during World War II. It was replaced by 4.5-in. and 5.5-in. guns.

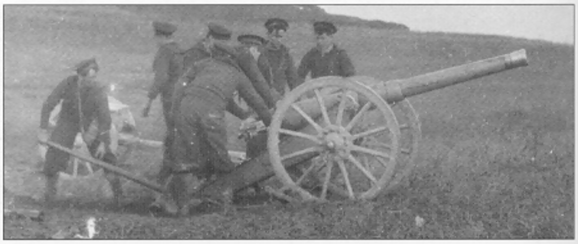
SPECIFICATION	
Nomenclature:	Ordnance BL 60-pdr gun Mk. II on carriage BL 60-pdr Mk. IV
Total weight of gun and carriage:	5 ton 7cwt 2qr 8lb
Ammunition type:	separate loading BL
Calibre:	5-in.
Projectile type and weight:	HE, 60lb; shrapnel; smoke
Maximum range:	15,500 yards

MISCELLANEOUS WEAPONS

QF 12-pdr 8cwt field gun

The QF 12-pdr 8cwt was a handy, simple and robust naval landing gun that saw service in the Boer War and elsewhere. Because of the ammunition shortage that afflicted the British artillery in Gallipoli during 1915 the local Commander Royal Artillery (CRA) suggested that a number of 12-pdr guns, for which ammunition was plentiful, be disembarked from the fleet and handed over to the Royal Artillery for forward work in the trenches. The guns, having only rudimentary tangent sights, were laid by clinometer, or down the bore. Recoil was checked with drag shoes. The Royal Artillery found the guns very accurate for range, but not for line. Two of the 12-pdrs were named after celebrities: *Marie Lloyd* (97th Battery, 29th DA) and *Harry Tate* (10th Battery, 29th DA). On 14 July 1915 *Marie Lloyd* was dragged into the front line trenches, opening fire on the Turkish positions at dawn the following morning, at a range of 200 yards, 'doing immense damage'. Following the withdrawal from the beach-head in January 1916, the 12-pdrs returned to the fleet. The gun was replaced in naval service by the 3.7-in. pack howitzer.

Royal Navy landing party with a QF 12-pdr 8cwt and limber, Russia, 1919. (IWM Q35015)



90mm field gun (French)

In 1915 the Board of Ordnance conducted trials on the French M1886 90mm field gun. As this was an obsolete weapon, lacking carriage recoil, the Board's interest has mystified some researchers. In fact the gun, being available as surplus, was pressed into service as a training weapon for the New Army artillery units, and therefore first needed to be assessed by the authorities. On its formation in early 1915, the 20th DA, for example, was equipped with two 90mm and two 15-pdr guns per brigade. The gun was declared obsolete in March 1920.

ABOVE **British troops laying a German M98/09 105mm light field howitzer, Fouchy, Battle of Arras, April 1917. The crew are ready with a shell and cartridge, and are using a British No. 7 Dial Sight to lay the gun. (IWM Q5193)**

Captured German field artillery

When warfare on the Western Front became sufficiently mobile for German batteries to be overrun, guns were taken and turned against their former owners for as long as the ammunition lasted. The 32nd Division captured a battery of 77mm guns in April 1918, and five serviceable guns were crewed by men of the trench mortar batteries, who the Padre described in his diary as having a 'great time brassing them off with all the ammunition they could get hold of for a couple of days'. Two 77mm guns were added to 42nd Battery, 2nd Brigade, 6th DA, in the British attack of September 1918, while 17th Brigade, 29th DA, turned a captured 10cm gun and shelled Menin. In the same operation C and B Batteries, 162nd Brigade, 33rd DA, were reinforced with four captured 77mm guns, complete with a large supply of 'Yellow Cross' (mustard gas) shells, with which the detachments bombarded the enemy 'with grim delight'.

6-in. Stokes-Newton trench mortar, Mesopotamia, 1917. (IWM Q24810)

Mortars

French Dumézil, 2-in., 3.7-in., 6-in. (Stokes-) Newton and 6-in. Stokes

Trench mortars entered service in 1915, and were described by one contemporary authority as belonging to a 'material-destroying, not man-killing class of weapon'. Those used by the field artillery are listed above – typically brutally simple, smoothbore, muzzle-loading weapons. Some were made in factories established by the Royal Engineers behind the front line, such as the 'Béthune Bomb Factory', where a 3.7-in. mortar smoke bomb was developed and manufactured and mortars built from recycled materials, including brass from expended shell cases, steam boiler tube (for barrels) and the threaded rod from US-manufactured 18-pdr ammunition boxes – which became elevating screws. The lack of any recoil-absorbing system, the large size of the projectiles, and the Heath-Robinson quality of design and build made trench mortars short-lived weapons – in the case of the 6-in. Stokes mortar, the stays connecting the mortar to its bed (and holding the barrel upright) were apt to break away suddenly with depressing consequences. 'Prematures' bursting at the muzzle would kill the entire crew in the claustrophobic confines of a TM pit. TMs took over a minute to prepare for firing and could not be kept ready because the charge deteriorated when exposed to air. Although operated by the RFA (and indeed the infantry), British TMs of World War I were 'artillery of position', immobile.

COLOUR SCHEMES

The 1900 handbook for the 15-pdr 'Ehrhardt' specified that it should be painted with two coats of 'khaki-colour, applied thinly and evenly over the surface, avoiding elevating screws and bright parts'. Markings were to be applied in black. The Ehrhardts were destined for the Aldershot Army Corps, and it is therefore quite apparent that, even at that early date, khaki was the colour used for artillery equipments based in the UK. Khaki was a light browny-green (a reasonable modern equivalent for modellers being Humbrol 'khaki drab'), which had started to replace traditional British artillery grey from 1891. It should be noted, however, that some colour sketches by J.C. Walford (an RFA officer), in the possession of the Royal Artillery Historical Trust, show an overall blue-grey in use during World War I, and there is a distinct possibility that this represents a survival of the traditional British artillery grey, at least with some batteries, as late as 1917. Photographs suggest that markings were always applied in white.

During World War I mid-green came into use for artillery and other equipment. When examined recently, a limbered wagon built by the Royal Carriage Department (the division of the Royal Arsenal at Woolwich that constructed gun carriages) was found to have been painted mid-to-dark-green at the time of its construction in 1916. It was difficult to determine the original colour and finish, as the lead whitener used in paints of the period blackens over time, but it is known that 'Light Brunswick green' and 'Dark Brunswick green' were the most widely used colours in Royal Engineers' camouflage parks during 1917–18. Finish was probably 'eggshell' rather than modern flat matt. Large patches of dark 'service' brown were subsequently applied over the green to produce a camouflage effect, and a mid-green/dark brown camouflage pattern is consistent both with a scheme shown in Walford's sketches, covering 1915–17, and interpretation of some monochrome photographs of field artillery on the Western Front during the same period (see plate C).

All the armies on the Western Front experimented with complex multi-colour 'dazzle' (disruptive) camouflage patterns. The darker colours in the dazzle schemes were probably service brown and green or khaki, but Walford's blue-grey also appears as part of a disruptive scheme (see Plate D1). Very bright stripes or irregular patches are to be seen in photographs of some British field artillery of 1917–18. As some very bold schemes were tried, and some battlefields were on chalk, it is possible that the bright stripes or patches are white, although another possibility is a light creamy sand. This was the earliest paint colour found on the BL 15-pdr displayed at HM Royal Armouries (see p. 36), when the gun was undergoing restoration, and also the latest colour to be found on the limbered wagon described above. In any case, white would have soon discoloured to an off-white or cream. Indeed, one should not be pedantic about tones – during World War I, colours of paint varied between batches and between manufacturers, just as they do today, only more so. Furthermore, the camouflaging of buildings in the UK caused shortages, which resulted in the use of inferior substitutes and paints from continental sources.

Whatever colour it was painted, equipment was kept clean and washed (mud was removed as soon as possible) – indeed one battery of the 32nd DA, seen on the road by its CRA with muddy equipment and harness, was punished by the cancellation of officers' leave. Washing would have left a diluted coating of whatever colour the local mud or dust was, and equipment would have appeared 'weathered'. Batteries coming out of the line or attending special occasions rubbed paintwork with an oily rag to produce a glossy finish, which also darkened the paint. Of the other surfaces, leather harness was treated with 'soap-and-oil', rather than polish, to protect it and keep it supple, giving a dull finish, and bright metalwork might be painted, rather than burnished, as normal peacetime 'bliffing' (polishing) was too time-consuming, too labour intensive and compromised camouflage. However, this varied at the whim of the battery, brigade or divisional commanders, and some field guns on the Western Front were photographed in action with bright metal dustcaps on their wheel hubs and bright steel at their muzzles. On other fronts khaki appears to have been standard, with occasional local camouflage variations (although the Transvaal Horse Artillery have restored their 18-pdr, a memorial to operations in German South West Africa, in an overall mid-grey scheme). During the immediate post-war period a high gloss mid-green ('deep bronze green') was adopted, which remains the British Army 'ceremonial' colour for equipment, including the QF 13-pdr guns of the King's Troop RHA.

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COLOUR PLATE COMMENTARY

A1: BLC 15-PDR FIELD GUN, 1ST WESSEX BRIGADE TF, UK, AUGUST 1914

CCXV Brigade (as it became), 43rd Divisional Artillery, served in India and Iraq. The brigade was re-equipped with QF 18-pdrs in July 1916. Note the distinctive profile of the BLC 15-pdr, due to the large steel cradle containing the 13-pdr-style recuperator. The gun is painted khaki in preparation for active service, with its designation 'BLC 15-pdr' sign-painted (not stencilled) in white lettering on the trail.

A2: DIAL SIGHT NO. 1

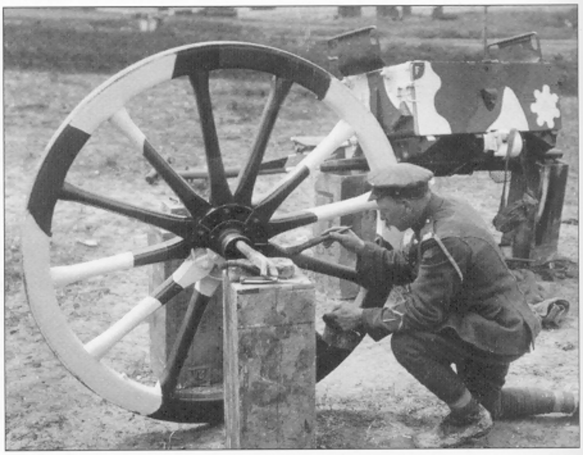
Indirect fire, that is engaging unseen targets from covered positions, first appeared in the British field artillery manual in 1906. Each gun was ordered to lay on a bearing using the battery leader's director (a simple tripod-mounted survey instrument) as the reference point. One gun, the pivot gun, of the battery would be aimed at the centre of the BC's area of responsibility (the zero point), with the remaining guns aligned on parallel lines. As the director might not be visible to all the guns, an aiming point (usually a landmark) might be used, for example the battery leader might order 'Aiming point church steeple. Right Section line of fire 50 degrees left. Centre Section line of fire 50 degrees 30 minutes left. Left section line of fire 51 degrees left.' Each gun layer would set the required angle on his dial sight, and then traverse the gun until the sights were set squarely on the steeple. The barrels, however, would be pointing the required number of degrees left or right. Even when the director was visible to all the guns, layers were taught to select a distant aiming point as soon as they had 'got the line', as the director might need to move. As distant points might be obscured by darkness or bad weather, aiming posts (see below) were put out at each gun. The original Dial Sight Number 1, was a simple aluminium disc, graduated in degrees, and fitted with a folding sight arm. It was mounted on the shield of the QF 13-pdr and 18-pdr guns – not an ideal position, as the sight did not traverse with the gun barrel. In 1910 it was replaced on more modern artillery by the Dial Sight No. 7, but remained in service during World War I on BLC 15-pdr and QF 15-pdr guns.

A3: QF 15-PDR FIELD GUN, B BATTERY, HONOURABLE ARTILLERY COMPANY, ADEN, AUGUST 1915

The two original HAC horse artillery batteries deployed to Egypt and then Mesopotamia, while duplicated batteries, A1 and B1 went to France. This gun is marked to A sub-section, B Battery, which first saw action against Turkish forces in Aden in 1915. A typical post-1908 TF horse artillery QF 15-pdr, it has the modified carriage, with a shield instead of axletree seats. Note the No. 1 Dial Sight and the pair of aiming posts strapped along the top of the trail. It has a standard khaki-colour paint scheme.

A4: AIMING POSTS

Two aiming posts were carried on each gun, typically one with a circular head, and another with a square head (so that alternate guns could set out differently shaped heads, to avoid confusion). Each post was four feet long, made of tubular steel, flattened and riveted at the head and with a solid steel point and foot piece let into the bottom end. They were painted with 1½-in. black and white stripes. The posts were set up in line at 50 yards and 100 yards, directly to the front or to the rear of the gun, to act as aiming points.



RFA gunner painting a limber, near Albert, 14 May 1918. The three-colour dazzle scheme includes two dark colours of almost identical tone. The limber carries the sign of the 35th Division. (IWM Q11505)

B1 AND B2: QF 13-PDR GUN, D BATTERY, RHA, INEXENT, 20 JUNE 1918

The RHA maintained the highest standards of turnout, and that is reflected in this illustration. As much metal as possible has been kept free of paint and brightly polished while the khaki-colour paint has been rubbed with oil to give a semi-gloss finish. The gun is fitted for the No. 7 Dial Sight. When not in use, the sight was removed, complete with its carrier, and placed in a sprung holder on the inside right of the shield, under a canvas cover.

B3: DIAL SIGHT BRACKET, DIAL SIGHT CARRIER NO. 2 MK. III, DIAL SIGHT NO. 7 MK. II

The No. 7 Dial Sight entered service in 1910. A much more sophisticated device than the No. 1, it was based on a German-designed 'panoramic telescope'. It consisted of a periscope with a rotating head, above a disc calibrated in degrees to the left and right. The periscope head was adjusted just like the sight arm of the No. 1 Dial Sight, but without the layer moving from his seat. As the sight also gave a magnification of 4x, it could be set straight to the front and used for direct fire, instead of the Sight Telescope fitted to field guns. The bracket was bolted alongside the open sights of the 13-pdr and 18-pdr. The sight was held in a Dial Sight Carrier (No. 1 for the 4.5-in. howitzer and No. 2 for the 13-pdr and 18-pdr Mk. I and II). The Carrier No. 2 Mk. I included a micrometer to rotate the sight slightly to allow for 'drift' (the tendency of the spinning projectile to travel to the side of the line of fire) and deflection (an error to the left or right caused by the gun being positioned on uneven ground, or a crosswind, or any combination of factors), but this was abandoned on later marks.

C1 AND 2: QF 4.5-IN. HOWITZER, 104TH BRIGADE, 22ND DIVISIONAL ARTILLERY, FRANCE, 1917

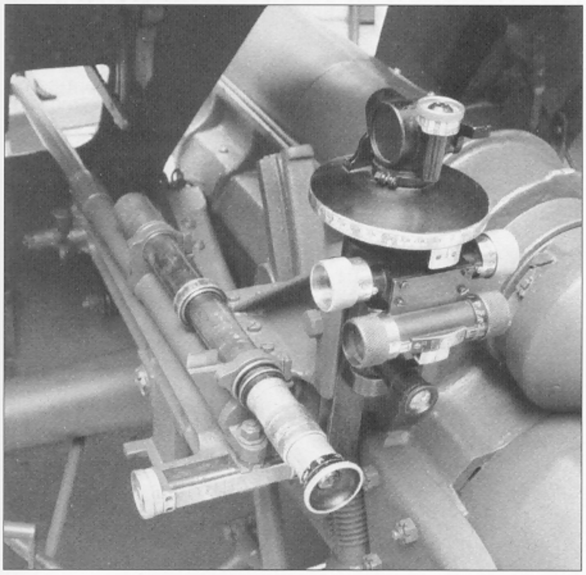
J.C. Walford sketched 18-pdr field guns and limbers of 104th Brigade, RFA, being painted with a 'new camouflage scheme' in mid-1917. This illustration shows the scheme applied to the brigade's QF 4.5-in. howitzers. The green and brown camouflage is applied over an existing mid-grey scheme, obliterating any markings and all but the most necessary 'bright work' (bare metal). Note that the howitzer is fitted with the same No. 7 Sight as the QF field guns.

C3: FUSE INDICATOR

All field artillery (guns and howitzers) carried a fuse indicator strapped to the inside top of the shield. Rather like a giant slide-rule, the fuse indicator showed the time setting to be applied to a shell fuse to get a shrapnel shell to burst at the ideal point for any given range. The inner strip or 'slide' could be replaced, depending on the type of fuse in use. The illustration shows the strip marked for 'Time and Percussion No. 82'. The slide was moved to align with the 'corrector setting' given as part of the BC's fire order (150 was the normal or default position), and clamped. Then the C-shaped 'reader' could be slid along the indicator to the range selected (upper scale) and the fuse setting read off (middle scale). In the case of the QF 4.5-in. howitzer the process was slightly complicated by the fact that there were five different charges to choose from, hence the 'charge scale' on the lower left of the indicator.

C4: HOWITZER AMMUNITION

The QF 4.5-in. howitzer differed from the 13-pdr and 18-pdr guns in having separate ammunition. The shell was loaded first and rammed home with a short wooden rammer, then the cartridge case placed in the chamber and the breech closed. The howitzer used a comparatively small charge, considering the size of its shell. Under the leatherboard lid were five charges, in ring-shaped cambric bags. Four could be removed to vary the howitzer's range for any given barrel angle. Although HE (bottom) was the standard round, the 4.5-in. howitzer also had a shrapnel shell (top), containing around 480 lead alloy balls of 38 to the pound.



Sights on an 18-pdr field gun displayed at the Imperial War Museum, Lambeth. *Left to right*: Open Sight (just visible as a bright patch on the rearmost rib of the cradle), No. 7 Dial Sight in No. 2 Carrier and No. 4 Telescope, mounted above the Rocking Bar Sight. (Author's photograph, reproduced courtesy of IWM)

D1: QF 18-PDR FIELD GUN, 63RD (ROYAL NAVAL) DIVISION, LESBOEUFS, SOMME, 1918

This reconstruction is based on a detailed colour illustration by J.C. Walford, 'Guns of the 63rd Royal Naval Division running the gauntlet of German patrols in Lesboeufs on the Somme, 23rd March 1918' (RAHT). Walford frequently depicts 18-pdrs painted overall blue-grey, but in this case the guns, limbers and wagons are over-painted with a dazzle scheme of brown patches edged with yellow. The gun is a Mk. II on carriage Mk. II, with hydro-pneumatic recuperator.

The Royal Naval Division was formed in 1914 'to make the best possible use of surplus naval reservists' and originally comprised one Royal Marine and two Royal Naval infantry brigades. The division transferred from Admiralty control to the War Office in April 1916, becoming the 63rd (Royal Naval) Division. The new 63rd comprised two Naval Brigades, 188th and 189th, and an Army Brigade (the 190th). The Naval Division made every effort to preserve its naval heritage and, in the words of the divisional history, 'even the Artillery, purely military in origin, who were attached to the Division, adopted with the utmost punctilio its naval customs, and so continued to the end of the War.'[1] In March 1918 the Divisional Artillery consisted of the 88th (attached), 223rd and 317th Brigades, RFA, Divisional Ammunition Column and two 6-in. Stokes mortar batteries.[1]

D2: 18-PDR FUSE CAP AND CARTRIDGE BASE CLIP

The fuses were protected with a brass fuse cover and the primer (in the base) by a cross-shaped 'safety clip'.

D3: RANGE INDICATOR, QF 18-PDR FIELD GUN

The Layer, the 'Number 3', on the left side of an 18-pdr, laid (aimed) the gun, while the 'Number 2' on the right, set the barrel to the correct elevation to ensure that the shell travelled the required distance. The layer's elevating wheel moved both the barrel and the sights, effectively 'pointing' the gun at the target (if he could not actually see the target, which was generally the case, he would elevate the gun using a 'sight clinometer' (a small, calibrated spirit-level attached to the rocking bar sight), to an angle given by the battery leader or BC). The Number 2's elevating wheel (*left*) moved just the barrel, which generally needed to point above the 'line of sight' if the shell, following a curved trajectory, was to reach the target. The range (in yards) for a given angle was displayed on the face of the nickel alloy 'range scale ring' (*right*), the elevation, in degrees, on the edge. The reader scale could be adjusted for muzzle velocity, to compensate for wear in the gun barrel (which shortened range).

D4: CARRIAGE LIMBER

Carriage limbers carried the 'divisional sign' painted (stencilled, according to the Divisional History), about six

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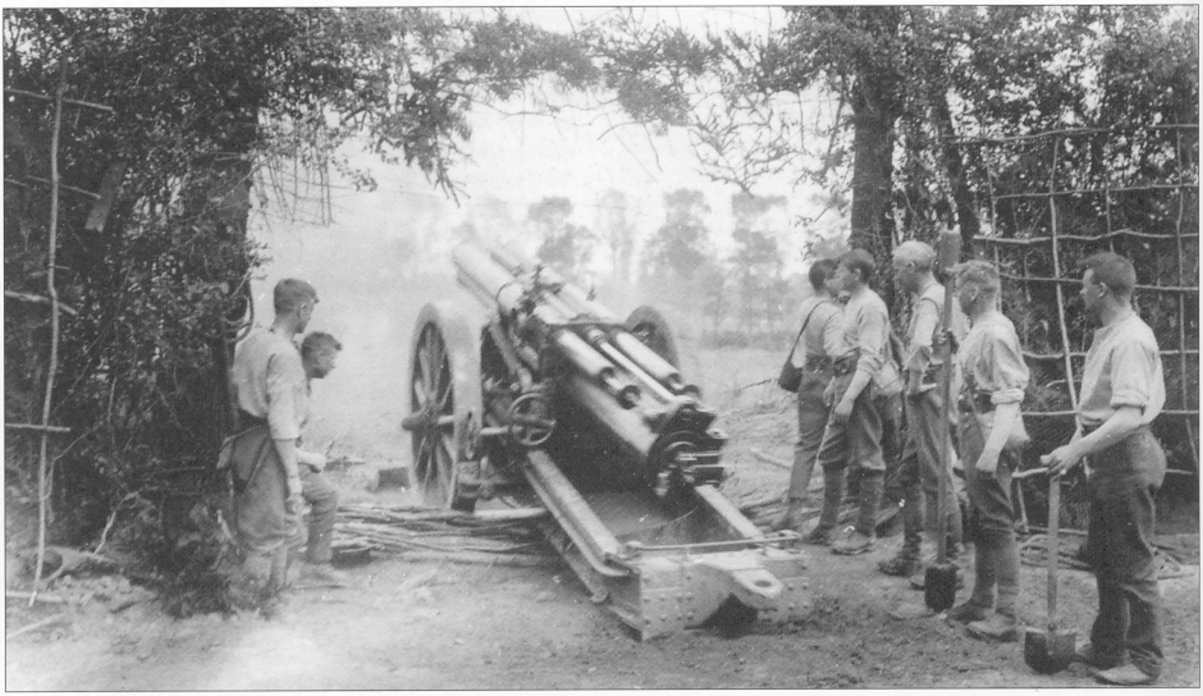
[1] Jerrold, D., The Royal Naval Division, 2nd edition, London, c. 1927.



BL 60-pdr Mk. I firing from an elaborate camouflaged hide, Dainville, 12 May 1916. (IWM Q563)

inches square, on the right side of the door. Walford shows the 63rd Division badge as a dark blue or black anchor on a red square, painted on equipment and as a cloth patch on the gunners' shoulders (although another reference shows the badge as a red anchor – of identical and distinctive shape – on navy blue).

D5: 18-PDR AMMUNITION

Left to right: HE; HE streamline; HE reduced charge; shrapnel; shrapnel reduced charge; smoke.

18-pdr ammunition came as fixed rounds or 'cartridges', packed four to a box, the boxes being wood, stained 'Vandyke brown' (or painted green for smoke shells, or red for blanks). Ammunition was colour-coded on the base, so that it could be identified end-on in the wagon or limber. Because the charge could not be varied, 'reduced charge' rounds were produced for training purposes or use in hilly country where effective range was limited (they also reduced barrel wear). 'Streamline HE' entered service shortly after World War I. The streamlining was achieved by tapering the shell at the base and extended the 18-pdr Mk. IV's range to 10,400 yards.

D6: QF 18-PDR FIELD GUN, 63RD (ROYAL NAVAL) DIVISION (REAR VIEW)

E1: BL 60-PDR MK. II AND TEAM

Heavy draught (HD) horses, such as Clydesdales or Suffolk Punches, drew heavy artillery. The BL 60-pdr was drawn by an eight-horse team, which was only expected to walk when harnessed to the gun and limber. This was enough to keep up with the field army, which, as a whole, could only advance as fast as the infantry could march. Originally the teams were led, with a driver beside each nearside horse and an assistant with each offside horse. The detachment marched behind.

E2: QF 18-PDR AND TEAM

Six-horse teams drew the guns and howitzers of the RFA, the guns of the RHA, and their ammunition wagons. Field artillery horses were of the type known as 'vanners', light draught (LD) animals of 15.3 hands at four years. Those for the RFA were expected to be able to trot in harness, while RHA horses were to 'gallop freely'. The harness was well designed; it was a straightforward matter to add another pair, if required, and a dead or injured horse could be removed with the minimum of difficulty and delay. The drivers' saddles did not form part of the harness, but were standard GS (general service) saddles. RHA detachments were mounted on their own horses, to reduce the weight pulled by the gun and wagon teams. The detachment followed to the right rear of the gun, the ammunition wagon occupying the left rear. Only the Numbers 1 and 10 of an RFA detachment rode their own horses, Numbers 2 and 3 rode on the carriage (i.e. gun) limber, 5 and 6 on the 'firing battery' wagon limber and number 4 on the wagon. 7 and 8 rode on the 'first line' wagon limber, number 9 on the wagon. Numbers 2, 4, 6 and 8 all sat on the nearside, Numbers 3, 5, 7 and 9 on the offside. The number 1 positioned his horse on the left of the lead pair of the gun team, the Number 10 positioned his to the left of the lead pair of the firing battery wagon.

E3: BL 2.75-IN. MOUNTAIN GUN, MULE DRAUGHT

Where possible, mountain guns would be moved fully assembled, saving time and imposing less of a strain on the mules. The BL 2.75-in. gun could be drawn, fully assembled, by two mules in tandem, or without its shield and outer leg sections, by a single mule. Mules were led by a driver walking on the nearside. The detachment marched (or climbed).

E4: BL 10-PDR MOUNTAIN GUN, MULE DRAUGHT

When it was first issued, the BL 10-pdr was accompanied by the limber BL 10-pdr Mk. I, which was an old RML 7-pdr limber converted by removing the limber box and replacing it with a triangular frame, with a pair of hooks on each side, to enable a standard mule ammunition box to be hung on each side. The limber was later abandoned, as the gun could easily be drawn by a single draught animal (a mule or even a Highland pony) using shafts. Standard pack harness was used, so that the gun could be placed on the animals' backs as soon as the terrain made it necessary.

F1: BL 60-PDR GUN MK. I, 29TH DIVISIONAL ARTILLERY, CAPE HELLES, GALLIPOLI, 1915

During 1915, British ammunition manufacture failed to keep up with demand – unfortunately coinciding with the commencement of operations in the Dardanelles. The 60-pdr guns of the 29th DA, ashore at Gallipoli, were allocated a daily ammunition scale of two rounds each, the same for 4.5-in. howitzers and 18-pdr guns, and four rounds for 10-pdr mountain guns. This BL 60-pdr Mk. I, on carriage Mk. I, is painted khaki, and carries the chalked name *ANNIE* on the recuperator spring case.

F2: QF 4.7-IN. GUN, 111TH BATTERY, RGA, 7TH DIVISIONAL ARTILLERY, FRANCE, 1914

111th Battery, RGA, was formed after the outbreak of war to provide heavy artillery, in the form of four QF 4.7-in. guns, for the 7th Division. The gun is mounted on the purpose-built carriage, travelling, QF 4.7-in. Mk. I, and freshly painted in khaki. The QF 4.7-in. gun was a fortress or naval gun mounted on a field carriage and the result was not entirely satisfactory. The gun only recoiled 12 inches in its cradle (the BL 60-pdr recoiled five feet), and much of the shock of recoil had to be taken by a carriage-mounted spade, similar to that fitted to the old BL field guns. This, and the shape of the short carriage, caused the trail to dig itself into the ground. 'Digging in', and the guns' age, resulted in the gallant old 'Four-Point-Seven' ending its service with an unfortunate reputation for inaccuracy and 'dropping short'.

F3. CARRIAGE, TRAVELLING, QF 4.7-IN., CONVERTED

The conversion of obsolete RML 40-pdr carriages enabled TF batteries to be armed, despite a strictly limited budget. However, the converted carriage weighed 11cwt more than the purpose-built QF 4.7-in. travelling carriage and lacked the independent wheel brakes of the latter.

G1. BL 2.75-IN. MOUNTAIN GUN, 4TH (HIGHLAND) MOUNTAIN BRIGADE, SALONIKA, 1916

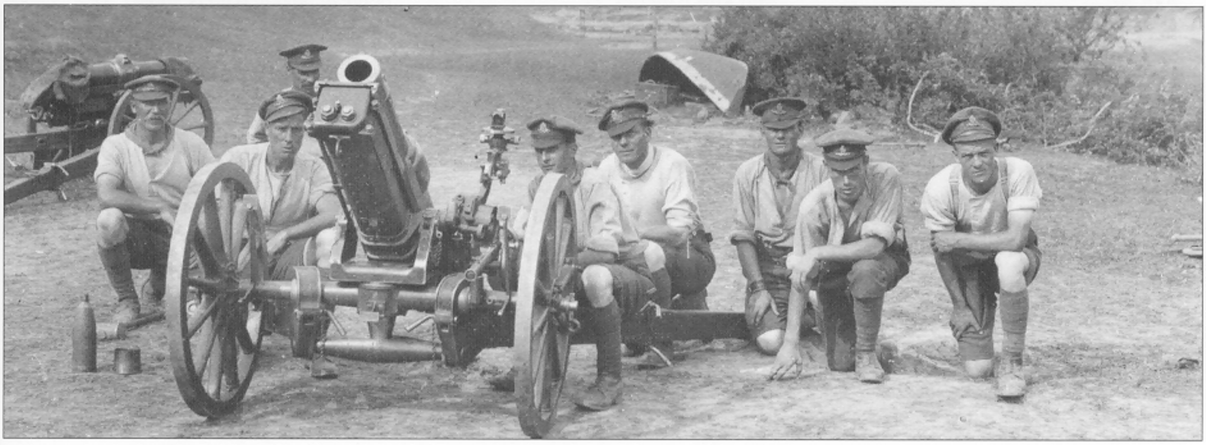
The 4th (Highland) Mountain Brigade landed at Gallipoli in April 1915, armed with BL 10-pdr mountain guns. Re-equipped with BL 2.75-in. mountain guns, the brigade moved to Greece in August 1916 and joined the British contingent in the Balkans. For this gun, an overall khaki colour scheme would be quite correct; however, a more colourful 'dazzle' scheme is illustrated, based on a monochrome photograph of a BL 2.75-in. gun from the collection of the Imperial War Museum. The overall colour, assumed to be khaki, has been over-painted with irregular darker patches, edged with a very dark colour. These have been interpreted as dark brown edged with black. The effect is similar to German disruptive schemes of the period. It is interesting to note that the scheme does not extend to the barrel. This may be because the barrel was repainted, due to the amount of wear and tear it would have received on operations.

G2. 'WHEELS AND AXLE MULE', BL 2.75-IN. MOUNTAIN GUN

The 2.75-in. carriage was considerably more complicated than that of the BL 10-pdr, which preceded it. The equipment broke down into wheels and axle; carriage trail, front part; carriage trail, rear part; recoil cradle; breech; chase. Note the aiming post secured beneath the axle.

G3. QF 3.7-IN. MOUNTAIN HOWITZER, 55TH BATTERY, RFA, ARCHANGEL, RUSSIA, 1919

55th Battery, Royal Field Artillery, was formed in early 1919 for service in Russia with the new 3.7-in. mountain howitzer (which had only been in service for 18 months). After four adventurous months fighting the Bolsheviks, the battery returned to the UK and disbanded. The howitzer is painted khaki, but the repeated handling to which all the parts of a mountain gun are exposed has rubbed the paint off most edges and thinned the finish.



3.7-in. mountain howitzer and crew from the Sadlier-Jackson Brigade, Troitsa, Russian Front, 1919, shield omitted. An upturned boat in the background is being used to store ammunition. (IWM Q16189)

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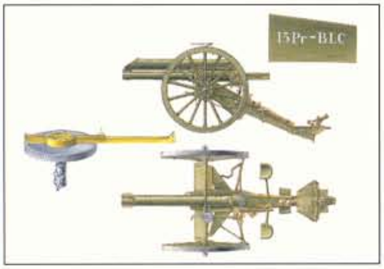

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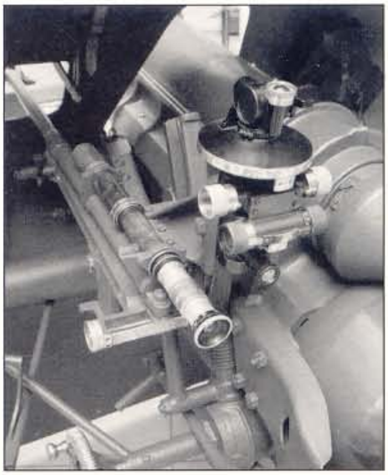

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British Artillery 1914–19

Field Army Artillery

In 1914 the artillery of Britain's 'Field Army' encompassed those weapons judged to have sufficient mobility to keep up with troops in the field. This book describes all major variants, from the 60-pdr guns of the heavy field batteries, perched somewhat uncomfortably on the cusp between field artillery and siege artillery, to the 2.75-in. guns of the mountain batteries, almost toy-like in comparison. Between these two extremes lay the bulk of the artillery of the Field Army: the 13-pdr guns of the Royal Horse Artillery and the 18-pdr guns and 4.5-in. howitzers of the Royal Field Artillery batteries.

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